

Hawano Project

Biological Technical Report

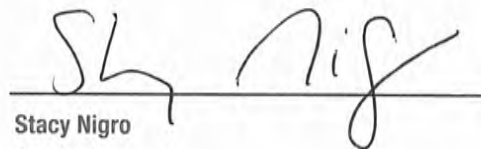
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Hawano Project Biological Technical Report

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SUMMARY (ABSTRACT)

This biological technical report was prepared to evaluate the approximately 79-acre Hawano project site. The project site consists of vacant land located on Otay Mesa in southern San Diego County, just north of the border with Baja California, Mexico. Implementation of the project would be required to go through the Multiple Species Conservation Program (MSCP) Subarea Plan Amendment process to receive take authorization for MSCP-covered species.

The proposed project consists of an application for a Tentative Map (TM) to subdivide the property into 23 light industrial lots on 65.6 acres and one detention basin lot on 2.47 acres. The remaining 11.5 acres of the site would be reserved for on-site roadways. Proposed lot sizes range from 1.9 acres to 5.5 acres. The TM would allow for the construction of up to 852,426 square feet of light industrial land uses on the site

The project would be developed in two phases. Phase 1 of the project would comprise the northern half of the site (areas north of Siempre Viva Road) and would include approximately 432,682 square feet of building area. Phase 2 of the project would comprise the southern half of the site (areas south of Siempre Viva Road) and would include approximately 419,744 square feet of building area.

Implementation of the project would require improvements to roadways, both on- and off-site. Proposed roadway improvements would include half-width frontage improvements to Alta Road (north of Siempre Viva) and full-width frontage improvements to Airway Road, Via de la Amistad, and Alta Road (south of Siempre Viva Road). The extension of Via de la Amistad eastward across the southern portion of the site would terminate at Alta Road. In addition, the project would construct half-width improvements to Airway Place (from Airway Road to Siempre Viva Road), as well as full-width improvements for on-site portions of Siempre Viva Road, and full-width construction of two cul-de-sacs (Hawano Drive North and Hawano Drive South). The proposed project would improve off-site portions of Siempre Viva Road to its ultimate full width (from project boundary to existing Siempre Viva Road).

The project would install water, recycled water, sewer, and storm drain infrastructure within the rights-of-ways of frontage and on-site roadways. Off-site improvements would include the installation of a sewer force main within a 20-foot easement within undeveloped portions of Via de la Amistad (from the project boundary to existing Via de la Amistad). Proposed sewer facilities would connect to existing facilities within Enrico Fermi Drive. In addition, a 1.0-acre sewer pump station would be constructed off-site at the northeast corner of the intersection of Via de la Amistad and Alta Road.

Five (5) vegetation communities/habitats occur on site and include road pools with San Diego and/or Riverside fairy shrimp, southern willow scrub, non-native grassland, disturbed habitat, and developed land.

Areas under jurisdiction of the U.S. Army Corps of Engineers (Corps) occur on site and consist of 0.06 acre of road pools with fairy shrimp. No Corps jurisdictional areas occur in the off-site improvement area. No areas under jurisdiction of the California Department of Fish and Game

(CDFG) occur on site or off site. In addition, no County of San Diego (County) Resource Protection Ordinance (RPO) wetlands occur on or off site.

One (1) sensitive plant species (small-flowered morning glory [*Convolvulus simulans*]) occurs on site. Ten (10) sensitive animal species were observed or detected on or adjacent to the site during surveys, including the federally listed endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*) and Riverside fairy shrimp (*Streptocephalus woottoni*). Two (2) species are listed as Birds of Conservation Concern (BCC) by the U.S. Fish and Wildlife Service (USFWS; burrowing owl [*Athene cunicularia*] and loggerhead shrike [*Lanius ludovicianus*]) and 1 species is on the CDFG Watch List (WL; California horned lark [*Eremophila alpestris actia*]). Five (5) animal species observed or detected on site are listed as a State Species of Special Concern (SSC): western spadefoot (*Spea hammondi*), grasshopper sparrow (*Ammodramus savannarum*), northern harrier (*Circus cyaneus*), loggerhead shrike (previously identified), and San Diego black-tailed jackrabbit (*Lepus californicus bennetti*). The County sensitive turkey vulture (*Cathartes aura*) also has been observed on site. A total of 22.8 acres of the site (approximately 29 percent) lies within Critical Habitat for San Diego fairy shrimp, and an additional 6 acres in the off-site improvement area. The project site also is within the territory of a golden eagle (*Aquila chrysaetos*) pair known to nest in O'Neal Canyon approximately 2 miles northeast of the project site.

The proposed project would result in direct impacts to approximately 83.2 acres of sensitive vegetation communities on and off site: 0.06 acre of road pools with fairy shrimp, 0.08 acre of southern willow scrub, and 83.1 acres of non-native grassland. Implementation of the proposed project would impact 0.06 acre of Corps jurisdictional areas (road pools with fairy shrimp).

The proposed project would result in direct impacts to all small-flowered morning glory on site. Project-related activities also would result in direct impacts to locations of 9 sensitive animal species: San Diego fairy shrimp, Riverside fairy shrimp, western spadefoot, burrowing owl, California horned lark, grasshopper sparrow, northern harrier, turkey vulture, and San Diego black-tailed jackrabbit. In addition, project implementation would impact potential foraging and/or nesting habitat for loggerhead shrike, as well as foraging habitat for golden eagle.

Impacts to road pools with fairy shrimp would be mitigated at a 5:1 ratio through off-site restoration and/or preservation of vernal pool habitat through consultation with the County and resource agencies. Impacts to non-jurisdictional southern willow scrub would be mitigated at a 1:1 ratio through purchase of credits at the Rancho Jamul Wetland Mitigation Bank. Impacts to non-native grassland would be mitigated at a 1:1 ratio through off-site preservation of grassland habitat.

Implementation of the proposed mitigation measures would reduce impacts to below a level of significance.

1.0 INTRODUCTION

1.1 PURPOSE OF THE REPORT

A biological resources study was conducted for the proposed Hawano project to provide the project applicant, County of San Diego (County), resource agencies, and the public with current biological data to satisfy review of the proposed project under the California Environmental Quality Act (CEQA) and to demonstrate compliance with federal, state, and County regulations. This report describes the project site's current biological conditions, vegetation communities, plant and wildlife species observed or detected during the surveys, and identifies those resources that are sensitive. It also identifies sensitive species with potential to occur within the project site. In addition, project impacts are assessed and mitigation is proposed to offset the proposed project's unavoidable significant impacts to sensitive biological resources.

1.2 PROJECT LOCATION AND DESCRIPTION

1.2.1 Project Location

The approximately 79-acre project site (Assessor's Parcel Number 648-070-17-00) is located in southeastern Otay Mesa immediately north of the U.S./Mexico border (Figure 1), at the current eastern terminus of Airway Road. It is located in Section 31 of Township 18 South, Range 1 East on the U.S. Geological Survey (USGS) 7.5-minute Otay Mesa quadrangle map (Figure 2).

The site is within the East Otay Mesa Specific Plan (EOMSP) area and is designated in the County's Multiple Species Conservation Program (MSCP; County 1997) as a Minor Amendment Area (see Section 1.5.3, below for an explanation of this designation).

1.2.2 Project Description

The proposed project consists of an application for a Tentative Map (TM) to subdivide the property into 23 light industrial lots on 65.6 acres and one detention basin lot on 2.47 acres. The remaining 11.5 acres of the site would be reserved for on-site roadways. Proposed lot sizes range from 1.9 acres to 5.5 acres. The TM would allow for the construction of up to 852,426 square feet of light industrial land uses on the site.

The project would be developed in two phases. Phase 1 of the project would comprise the northern half of the site (areas north of Siempre Viva Road) and would include approximately 432,682 square feet of building area. Phase 2 of the project would comprise the southern half of the site (areas south of Siempre Viva Road) and would include approximately 419,744 square feet of building area.

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project would construct half-width improvements to Airway Place (from Airway Road to Siempre Viva Road), as well as full-width improvements for on-site portions of Siempre Viva Road, and full-width construction of two cul-de-sacs (Hawano Drive North and Hawano Drive South). The proposed project would improve off-site portions of Siempre Viva Road to its ultimate full width (from project boundary to existing Siempre Viva Road).

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1.3 SURVEY METHODS

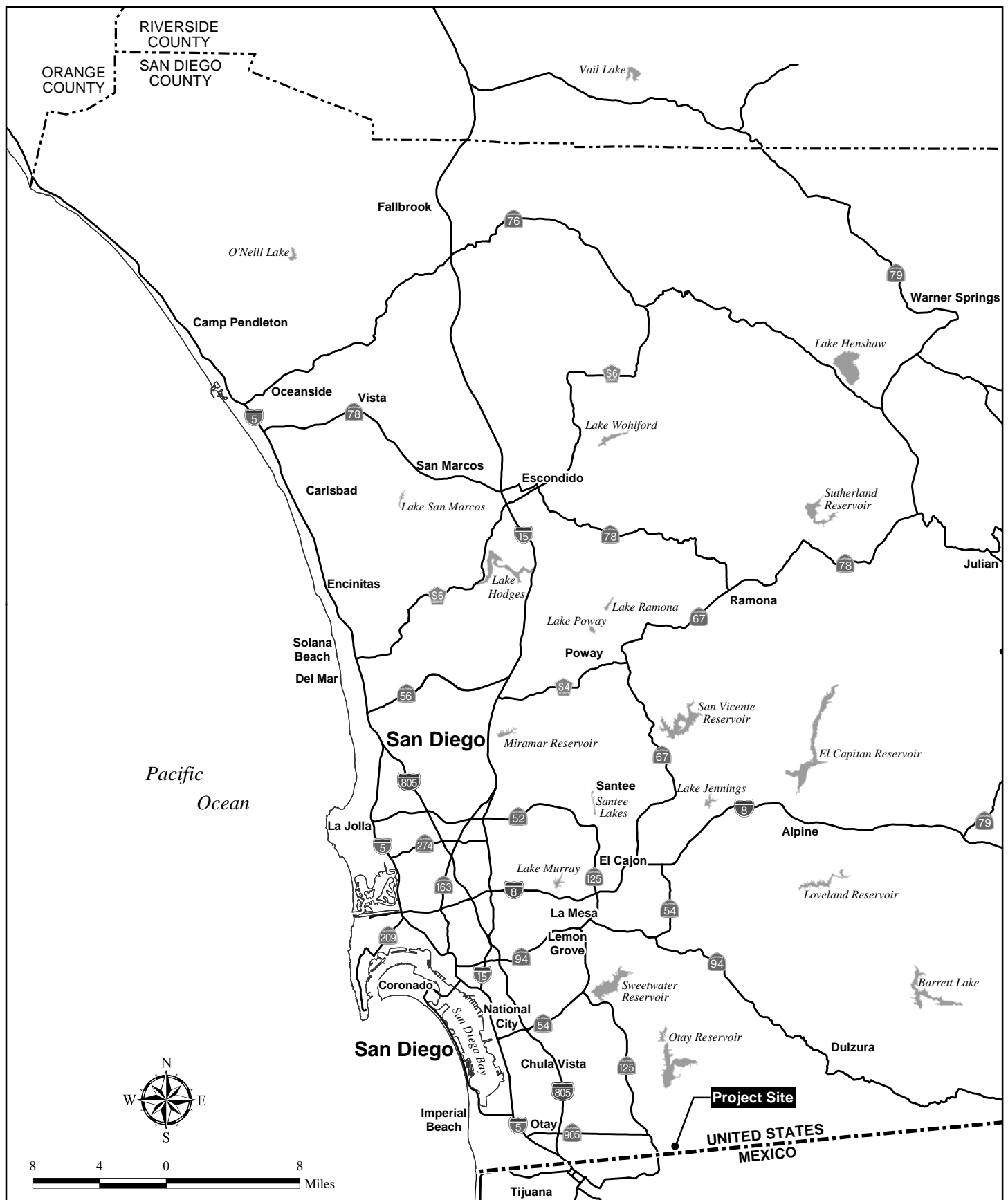
This report identifies sensitive species with potential to occur within the project site but that were not observed or detected during surveys, as well as sensitive species actually observed during focused project surveys. Surveys discussed in this report were conducted by HELIX Environmental Planning, Inc. (HELIX) between 2006 and 2010.

1.3.1 Literature Review

Prior to conducting biological field surveys, a search of the California Natural Diversity Database (CNDDDB) for information regarding sensitive species known to occur within the vicinity of the project site was performed by HELIX in 2010.

1.3.2 Biological Surveys

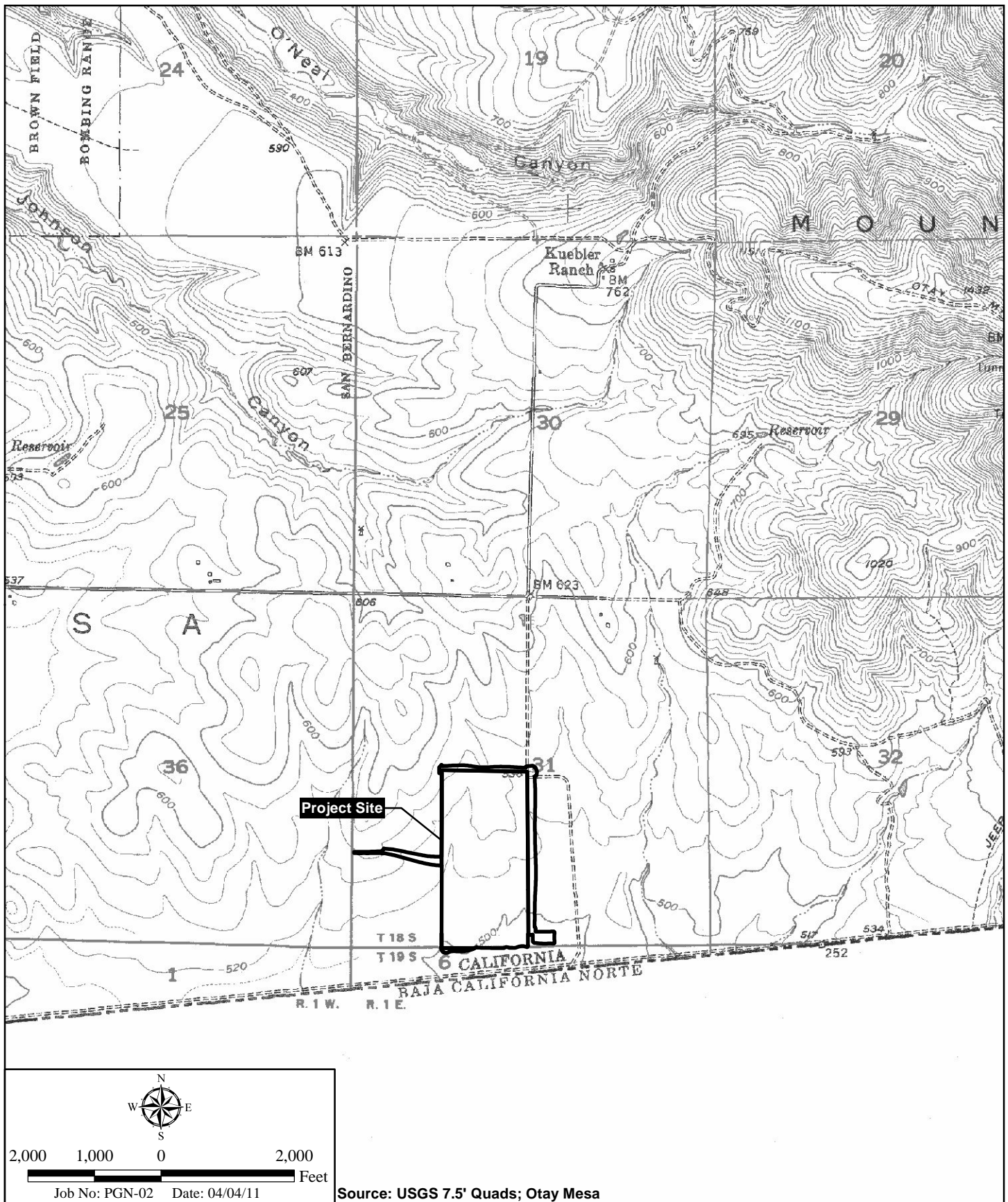
A general biological survey of the project site was conducted by HELIX on August 18, 2009. Vegetation was mapped on a 1"=200' scale aerial of the site. The entire site was surveyed on foot with the aid of binoculars and all detected plant and animal species were recorded. Animal identifications were made in the field by direct, visual observation or indirectly by detection of calls, burrows, tracks, or scat. All plant identifications were made in the field or in the lab through comparison with voucher specimens or photographs. General biological data, including vegetation mapping and species inventories, have been updated opportunistically based on results of subsequent surveys. In addition to the general biological survey, HELIX conducted a jurisdictional delineation (during field work for the State Route (SR) 11 project), as well as focused surveys for rare plants, Quino checkerspot butterfly, burrowing owl, and San Diego and Riverside fairy shrimp. See Table 1 for a list of survey dates.



Regional Location Map

HAWANO PARCEL

Figure 1



Project Location Map

HAWANO PARCEL

Figure 2

Table 1
SURVEY INFORMATION

Date	Personnel	Survey Type
April 20, 2006	Stacy Nigro	Jurisdictional delineation
August 18, 2009	Brian Parker	General biological survey, vegetation mapping
November 12, 2009	Dale Ritenour ¹	Fairy shrimp survey (dry season sampling)
December 12, 2009	Dale Ritenour ¹	Fairy shrimp survey
January 2, 2010	Dale Ritenour ¹	Fairy shrimp survey
January 13, 2010	Dale Ritenour ¹	Fairy shrimp survey
January 27, 2010	Dale Ritenour ¹	Fairy shrimp survey
February 11, 2010	Amy Mattson ¹	Fairy shrimp survey
February 23, 2010	Dale Ritenour ¹	Fairy shrimp survey
March 5, 2010	Dale Ritenour ¹	Quino checkerspot butterfly survey
March 9, 2010	Dale Ritenour ¹	Fairy shrimp survey
March 12, 2010	Dale Ritenour ¹	Quino checkerspot butterfly survey
March 15, 2010	Dale Ritenour ¹	Quino checkerspot butterfly survey
March 26, 2010	Dale Ritenour ¹	Fairy shrimp survey, Quino checkerspot butterfly survey
April 3, 2010	Dale Ritenour ¹	Quino checkerspot butterfly survey
April 10, 2010	Dale Ritenour ¹	Quino checkerspot butterfly survey, fairy shrimp survey
April 22, 2010	Dale Ritenour ¹ Erica Harris	Fairy shrimp survey
April 27, 2010	Dale Ritenour Erica Harris	Burrowing owl survey, rare plant survey
April 28, 2010	Jason Kurnow	Burrowing owl survey
April 29, 2010	Debbie Leonard Erica Harris	Burrowing owl survey
April 30, 2010	Jason Kurnow Erica Harris	Burrowing owl survey
June 24, 2010	Amy Mattson	Rare plant survey

¹ Employee of HELIX - USFWS Permit TE-778195-11

1.3.3 Focused Species Surveys

Focused surveys were conducted within the project site for several sensitive animals and are described below.

Rare plant surveys

Two rare plant surveys were conducted on site on April 27 and June 24, 2010 by HELIX biologists. Rare plants investigated included those that are listed as threatened or endangered by the USFWS or the CDFG; those that are on the County Sensitive Plant List (provided in County 2007); and narrow endemic species with potential to occur on site. The entire site was traversed by foot and all habitat areas were inspected for the presence of rare plant species. When encountered, sensitive plants were counted and mapped using handheld Geographic Positioning System devices. Rare plant species also were looked for opportunistically during numerous other surveys.

San Diego and Riverside Fairy Shrimp

HELIX conducted dry season fairy shrimp sampling on November 12, 2009 and wet season surveys for sensitive fairy shrimp between December 16, 2009 and April 22, 2010. Surveys were performed under HELIX's Threatened/Endangered species permit (TE778195) and were conducted pursuant to U.S. Fish and Wildlife Service (USFWS) protocol (1996a). Focused survey reports for fairy shrimp are included in Appendix G (HELIX 2010a-b).

Quino Checkerspot Butterfly

Protocol surveys for Quino checkerspot butterfly (QCB) were performed under HELIX's Threatened/ Endangered species permit (TE778195) and followed the guidelines outlined in the USFWS Year 2002 Survey Protocol for the QCB (USFWS 2002a) and QCB Survey Recommendations (USFWS 2002b). Six (6) protocol site visits were conducted by HELIX between March 5 and April 10, 2010. Surveys consisted of walking roughly parallel transects through appropriate habitat and identifying butterflies by sight and with the aid of binoculars. The focused survey report for QCB is included in Appendix G (HELIX 2010c).

Burrowing Owl

HELIX biologists conducted burrowing owl surveys on April 27, 28, 29, and 30, 2010. Suitable habitat was examined with the aid of binoculars by walking approximately parallel transects, with particular attention paid to any areas along fence lines and where rodent activity was observed or suspected. Burrowing owls also were looked for opportunistically during other surveys for the project. The focused survey report for burrowing owl is included in Appendix G (HELIX 2011a).

1.3.4 Jurisdictional Delineation

A jurisdictional delineation of the SR 11 study area was performed by HELIX on April 20, 2006; this study area overlapped the proposed project site. Prior to beginning fieldwork, aerial photographs (1"=200' scale), USGS topographic maps, and soil survey maps were reviewed to determine the location of potential jurisdictional areas that may be affected by the project. Relevant excerpts from the 2006 SR 11 jurisdictional delineation report are included in Appendix F (HELIX 2006).

Corps Jurisdictional Areas

All areas with depressions, drainage channels, or wetland vegetation were evaluated for the presence of Corps Waters of the U.S., including jurisdictional wetlands. Corps wetlands were delineated pursuant to the Wetlands Delineation Manual (Environmental Laboratory 1987). Areas were determined to be non-wetland Waters of the U.S. if there was evidence of regular surface flow (e.g., bed and bank) but the vegetation and/or soils criterion were not met.

CDFG Jurisdictional Areas

California Department of Fish and Game (CDFG) jurisdictional boundaries were determined based on the presence of riparian vegetation or regular surface flow. Streambeds within CDFG jurisdiction were delineated based on the definition of streambed as “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supporting fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports riparian vegetation” (Title 14, Section 1.72). The CDFG jurisdictional habitat includes all riparian shrub or tree canopy that may extend beyond the banks of a stream.

County Resource Protection Ordinance Wetlands

Areas were considered County wetlands if they met 1 of the 3 following attributes pursuant to the County Resource Protection Ordinance (RPO 2007): (1) at least periodically, the land supports a predominance of hydrophytes (plants whose habitat is water or very wet places); (2) the substratum is predominantly undrained hydric soil; or (3) an ephemeral or perennial stream is present, whose substratum is predominately non-soil and such lands contribute substantially to the biological functions or values of wetlands in the drainage system.

1.3.5 Survey Limitations

All noted animal species were identified by direct observation, vocalizations, or the observance of scat, tracks, or other signs. However, the lists of species identified are not necessarily comprehensive accounts of all species that occur on the site, as species that are nocturnal, secretive, or seasonally restricted may not have been observed.

1.3.6 Nomenclature

Nomenclature used in this report comes from Holland (1986) and Oberbauer (2008) for vegetation; Hickman, ed. (1993) and Rebman and Simpson (2006) for plants; Glassberg (2001) for butterflies; Collins and Taggart (2006) for reptiles and amphibians; American Ornithologists' Union (2009) for birds; and Baker et al. (2003) for mammals. Plant species status is taken from the California Native Plant Society (CNPS; 2010). Animal species status is from CDFG (2009).

1.4 ENVIRONMENTAL SETTING

The project site consists of a gently southward sloping mesa west of the foothills of the San Ysidro Mountains and just north of the U.S./Mexico border. Elevations on site range between

approximately 500 and 580 feet above mean sea level. Two (2) soil types occur on site: Diablo clay (2 to 9 percent slopes) and Salinas clay (0 to 2 percent slopes; Bowman 1973).

Land uses within the project vicinity include commercial and industrial development to the west and south, and mostly undeveloped lands to the east and north. The site is not adjacent to any preserved lands.

1.4.1 Regional Context

The project site is located within the South County Segment of the County's Multiple Species Conservation Program (MSCP) Subarea Plan, and the entire project site is identified as a Minor Amendment Area under this Plan (Figure 3). The County's Habitat Evaluation Model indicates that 1.61 acres of the project site are designated as Medium quality habitat, 6.5 acres have been designated as Low quality habitat, and 71.4 acres have been designated as agriculture. No areas designated as High or Very High quality habitat occur on site.

1.4.2 Vegetation Communities/Habitat Types

Five (5) vegetation communities/habitats occur within the project site or off-site improvement areas: road pools with San Diego and/or Riverside fairy shrimp, southern willow scrub, non-native grassland, disturbed habitat, and developed (Figure 4; Table 2). These vegetation communities are discussed below.

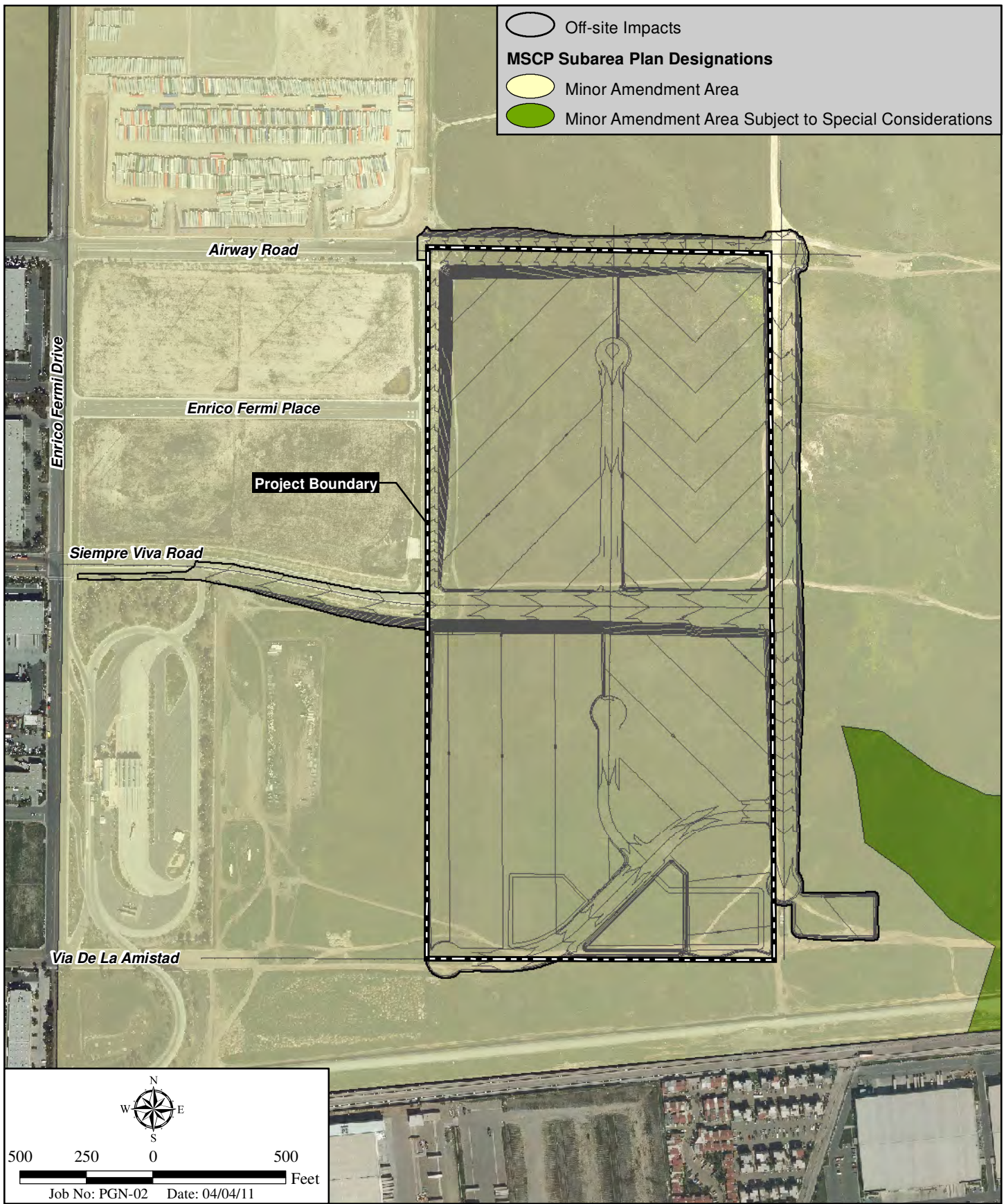
Sensitive habitat is defined as land that supports unique vegetation communities or the habitats of rare or endangered species or subspecies of animals or plants as defined by Section 15380 of the CEQA Guidelines. Sensitive vegetation communities on site include: road pools with fairy shrimp, southern willow scrub, and non-native grassland.

Table 2 EXISTING VEGETATION COMMUNITIES ON SITE		
Vegetation Community/Habitat*	Tier†	Acre(s)‡
Road pool with fairy shrimp (no code)	IV	0.06
Southern willow scrub (63320)	I	0.08
Non-native grassland (42200)	III	74.0
Disturbed habitat (11300)	IV	3.0
Developed land (12000)	IV	2.1
TOTAL		79.3

*Vegetation categories and numerical codes are from Holland (1986) and Oberbauer (2008)

†Tiers refer to County MSCP Subarea Plan habitat classification system

‡Upland habitats are rounded to the nearest 0.1 acre, while wetland habitats are rounded to the nearest 0.01; thus, totals reflect rounding



MSCP Subarea Plan Designations

HAWANO PARCEL

Watershed

Vegetation

Road Pool

Southern Willow Scrub

Emergent Wetland

Non-native Grassland

Disturbed Habitat

Developed

Sensitive Resources

BUOW

Burrowing Owl (*Athene cunicularia*)

BUOW +B

Burrowing Owl + Burrow

HOLA

California Horned Lark (*Eremophila alpestris actia*)

GRSP

Grasshopper Sparrow (*Ammodramus savannerum*)

NOHA

Northern Harrier (*Circus cyaneus*)

LOSH

Loggerhead Shrike (*Lanius ludovicianus*)

RIFS

Riverside Fairy Shrimp (*Streptocephalus woottoni*)

BTJR

San Diego Black-tailed Jackrabbit (*Lepus californicus bennettii*)

SDFS

San Diego Fairy Shrimp (*Branchinecta sandiegonensis*)

TUVU

Turkey Vulture (*Cathartes aura*)

WESP

Western Spadefoot Toad (*Spea hammondi*)

Cs

Small-flowered Morning Glory (*Convolvulus simulans*)

The map displays the project boundary and surrounding areas. Key features include:

- Vegetation:** Southern Willow Scrub (green), Emergent Wetland (purple), Non-native Grassland (yellow), Disturbed Habitat (orange), and Developed (grey).
- Sensitive Resources:** BUOW (Burrowing Owl), BUOW +B (Burrowing Owl + Burrow), HOLA (California Horned Lark), GRSP (Grasshopper Sparrow), NOHA (Northern Harrier), LOSH (Loggerhead Shrike), RIFS (Riverside Fairy Shrimp), BTJR (San Diego Black-tailed Jackrabbit), SDFS (San Diego Fairy Shrimp), TUVU (Turkey Vulture), WESP (Western Spadefoot Toad), and Cs (Small-flowered Morning Glory).
- Infrastructure:** Airway Road, Enrico Fermi Place, Siempre Viva Road, and Via De La Amistad.
- Matchlines:** Vertical dashed lines labeled "MATCHLINE See Below" and "MATCHLINE See Above".
- Scale and Orientation:** A scale bar from 0 to 300 feet and a north arrow.

I:\ArcGIS\PGN-02 Hawano\Parcel\Map\BIO\BTR\Fig4_Vegetation_SenRes.mxd -JP

Vegetation and Sensitive Resources

HAWANO PROJECT

HELIX
Environmental Planning

Figure 4

Road Pool with San Diego and/or Riverside Fairy Shrimp

Road pools are ephemeral water-holding basins formed on heavily compacted dirt in dirt trails and roads that lack vernal pool indicator plant species (Corps 1997). Such standing water has potential to support sensitive animal species such as San Diego and Riverside fairy shrimp and spadefoot toads. Within the context of this project, only basins that support San Diego or Riverside fairy shrimp are mapped as road pools; basins without fairy shrimp represent essentially puddles within other vegetation communities and are mapped as a part of the surrounding community. Three road pools totaling 0.06 acre occur on the project site (Figure 4). A fourth road pool was mapped just off site to the south and a fifth road pool was mapped just outside the off-site improvement area in the southeast corner of the site (Figure 4).

Southern Willow Scrub

Southern willow scrub consists of dense, broadleaved, winter-deciduous stands of trees dominated by shrubby willows (*Salix* sp.) in association with mule fat (*Baccharis salicifolia*), and with scattered emergent cottonwood (*Populus fremontii*) and western sycamore (*Platanus racemosa*). This vegetation community often occurs on loose, sandy or fine gravelly alluvium deposited near stream channels during flood flows. Frequent flooding maintains this early seral community, preventing succession to a riparian woodland or forest (Holland 1986).

Approximately 0.08 acre of southern willow scrub occurs along the western site boundary, at the toe of a manufactured slope (Figure 4). Species present include arroyo willow (*Salix lasiolepis*), Italian thistle (*Carduus pycnocephalus*), annual beard grass (*Polypogon monspeliensis*), ripgut grass (*Bromus diandrus*), and bristly ox-tongue (*Picris echioides*). This habitat occurs near and along the base of an adjacent manufactured slope and receives runoff from the adjacent slope and graded pad through a brow ditch as well as irrigation lines installed on the slope. Water conveyed to this area collects on the edge of and within the adjacent road and then sheet flows into non-native grassland to the south; it does not flow into or otherwise connect with a drainage or streambed.

Non-native Grassland

Non-native grassland is a dense to sparse cover of annual grasses, often associated with native annual forbs. This association occurs on gradual slopes with deep, fine-textured, usually clay soils. Most of the introduced annual species that comprise non-native grassland originated from the Mediterranean region of Europe, an area with a climate similar to that in California and a long history of agriculture. These 2 factors have contributed to the successful invasion and establishment of these species and the replacement of native grasslands with an annual-dominated non-native grassland (Jackson 1985).

Non-native grassland covers 74.0 acres on site (Figure 4) and characteristic species include oats (*Avena* spp.), red brome (*Bromus madritensis* ssp. *rubens*), ripgut grass, and black mustard (*Brassica nigra*).

Disturbed Habitat

Disturbed habitat includes land cleared of vegetation (e.g., dirt roads), land containing a preponderance of non-native plant species such as ornamentals or ruderal exotic species that take advantage of disturbance (previously cleared or abandoned landscaping), or land showing signs of past or present animal usage that removes any capability of providing viable habitat. Disturbed habitat totals approximately 3.0 acres on site (Figure 4) and is comprised of dirt roads.

Developed Land

Developed land exists where permanent structures and/or pavement has been placed (preventing the growth of vegetation) or where landscaping is clearly tended and maintained. Within the project site, developed land consists of a manufactured, irrigated slope along the northern half of the western site boundary, and covers approximately 2.1 acres of the site (Figure 4).

1.4.3 Flora

HELIX observed a total of 70 plant species within the project site during rare plant surveys as well as during other biological surveys (Appendix A).

1.4.4 Fauna

HELIX observed a total of 44 animal species during various biological surveys, including 9 butterfly, 3 other invertebrate, 3 reptile, 1 amphibian, 23 bird, and 5 mammal species (Appendix B).

1.4.5 Sensitive Plant Species

Sensitive species are those considered unusual or limited in that they are: (1) only found in the San Diego region; (2) a local representative of a species or association of species not otherwise found in the region; or (3) severely depleted within their ranges or within the region.

One sensitive plant species (small-flowered morning glory [*Convolvulus simulans*]) occurs on site. A brief description of this species is provided below. A key of the status codes presented can be found in Appendix E.

Small-flowered morning-glory (*Convolvulus simulans*)

Status: --/--; CNPS List 4.2; County Group D

Distribution: Occurs through much of coastal California from Contra Costa County south into Baja California, Mexico (Baja)

Habitat: Grows in friable clay soils in open areas typically mapped as coastal sage scrub, chaparral, or grasslands

Status on site: A total of 631 individuals were observed in a scattered distribution throughout the site.

Sensitive Plants with Potential to Occur

Sensitive plant species with potential to occur on site are included in Appendix C (alphabetically by scientific name). Refer to Appendix E for an explanation of status codes.

1.4.6 Sensitive Wildlife Species

Ten sensitive animal species were observed or detected on or adjacent to the site during surveys, including the federally listed endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*) and Riverside fairy shrimp (*Streptocephalus woottoni*). Two (2) species are listed as Birds of Conservation Concern (BCC) by the U.S. Fish and Wildlife Service (USFWS; burrowing owl [*Athene cunicularia*] and loggerhead shrike [*Lanius ludovicianus*]) and 1 species is on the CDFG Watch List (WL; California horned lark [*Eremophila alpestris actia*]). Five (5) animal species observed or detected on site are listed as a State Species of Special Concern (SSC): western spadefoot (*Spea hammondi*), grasshopper sparrow (*Ammodramus savannarum*), northern harrier (*Circus cyaneus*), loggerhead shrike (previously identified), and San Diego black-tailed jackrabbit (*Lepus californicus bennetti*). The County sensitive turkey vulture (*Cathartes aura*) also has been observed on site. In addition, the project site is within the reported territory of a golden eagle (*Aquila chrysaetos*) pair, but this species was not detected on site during project surveys.

Protocol surveys for QCB were negative (HELIX 2010) and the site is not considered occupied by this species.

A brief description of each animal species is provided below. A key of the status codes presented can be found in Appendix E.

Invertebrate

San Diego fairy shrimp (*Branchinecta sandiegonensis*)

Status: FE/--; County Group 1

Distribution: San Diego County and extreme northern Baja California, Mexico.

Habitat(s): Seasonally astatic pools, which occur in tectonic swales or earth slump basins and other areas of shallow, standing water often in patches of grassland and agriculture interspersed in coastal sage scrub and chaparral.

Status on site: Species observed in all 3 road pools occurring on site (Figure 4).

Riverside fairy shrimp (*Streptocephalus woottoni*)

Status: FE/--; County Group 1

Distribution: Currently known from vernal pools and other ephemeral basins in Riverside, Orange, and San Diego counties; northern Baja

Habitat: Typically deeper vernal pools and seasonal wetlands; as this species develops slower than other fairy shrimp species, typical pools are 30 cm or deeper (Simovich 1990)

Status on site: Observed in 1 road pool on site (Figure 4).

Amphibians

Western spadefoot (*Spea hammondi*)

Status: --/SSC; County Group 2

Distribution: Throughout the Central Valley and San Francisco Bay area south along the coast to northwestern Baja California.

Habitat(s): Occurs in open coastal sage scrub, chaparral, and grassland, along sandy or gravelly washes, floodplains, alluvial fans, or playas; require temporary pools for breeding and friable soils for burrowing; generally excluded from areas with bullfrogs (*Rana catesbiana*) or crayfish (*Procambarus* sp).

Status on site: Observed in one road pool in the northeastern portion of the site (Figure 4).

Birds

Burrowing owl (*Athene cunicularia*)

Status: BCC/SSC; County Group 1; MSCP Covered

Distribution: Lower British Columbia to Manitoba, Canada; central and western U.S. south to northern Mexico and Baja

Habitat: Open areas such as grasslands, pastures, coastal dunes, desert scrub, and agriculture fields.

Status on site: During focused surveys in 2010, 1 occupied burrow with 2 individuals was observed along the eastern site boundary, near Airway Place, and 1 occupied burrow with 1 individual was observed in the off-site impact area along Siempre Viva Road, west of the project site. Older observations occurred in 2006 and consisted of 1 individual in the southwest corner of the site, and 1 individual in the Alta Road off-site improvement area to the east (Figure 4). Based on these findings, it is assumed that 2 burrowing owl pairs occur in the project site and off-site improvement area and that the entire project site is occupied. Approximately 83.2 acres of habitat, consisting of all of the grassland on site (74.0 acres) and in the off-site improvement area (9.2 acres), is considered occupied by burrowing owls.

Grasshopper sparrow (*Ammodramus savannarum*)

Status: --/SSC; County Group 1

Distribution: Summer resident in coastal California and much of the U.S. east of the Rocky Mountains; winters in Mexico and South America

Habitat: Occurs in dense grasslands with low shrub cover

Status on site: One (1) individual was recorded by in the central portion of the site (Figure 4).

Golden eagle (*Aquila chrysaetos*)

Status: BCC; BGEPA/WL, fully protected; County Group 1; MSCP Covered

Distribution: Breeds from Alaska across northern Canada south to Mexico, Canadian prairie provinces, and Labrador. Winters in southern part of breeding range and in much of U.S., except the southeast

Habitat: Forages over grassy and open, shrubby habitats. Generally nests on remote cliffs; requires areas of solitude at a distance from human habitation

Status on site: None observed during project-related surveys of the site. The entire site supports appropriate non-native grassland foraging habitat but does not support nesting habitat. The project site lies within the territory of a pair reported to nest in O'Neal Canyon approximately 2

miles to the northeast. Because other golden eagle pairs are known to nest to the north and east of the O'Neal Canyon pair, the primary foraging area of the O'Neal Canyon pair is largely restricted to Otay Mesa.

Turkey vulture (*Cathartes aura*)

Status: --/--; County Group 1

Distribution: Observed throughout San Diego County with the exception of extreme coastal San Diego where development is heaviest. Reported to winter in the Santa Maria and Santa Teresa valleys.

Habitat(s): Foraging habitat includes most open habitats with breeding occurring in crevices among boulders.

Status on site: One individual observed flying overhead in the central portion of the site (Figure 4).

Northern harrier (*Circus cyaneus*)

Status: --/SSC; County Group 1, MSCP Covered

Distribution: Widespread throughout temperate regions of North America and Eurasia. Winters and migrates throughout California from below sea level in Death Valley to 9,800 feet. Known breeding areas in San Diego County include Torrey Pines State Park, Tijuana River Valley, and Camp Pendleton.

Habitat: Coastal, salt, and freshwater marshlands; grasslands; prairies

Status on site: A single individual was observed flying over the grassland in the southwest portion of the project site (Figure 4).

California horned lark (*Eremophila alpestris actia*)

Status: --/WL; County Group 2

Distribution: Coastal slopes and lowlands from Sonoma County to northern Baja

Habitat: Sandy beaches, agricultural fields, grassland, and open areas

Status on site: A single individual was detected along the eastern site boundary (Figure 4).

Loggerhead shrike (*Lanius ludovicianus*)

Status: BCC/SSC; County Group 1

Distribution: Widespread but declining throughout North America; winters in Central America

Habitat: Open habitats including grasslands, shrublands, and ruderal areas with adequate perching locations

Status on site: A single individual was detected just off site to the east of the southeast corner of the site (Figure 4).

Mammals

San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)

Listing: --/SSC; County Group 2

Distribution: Southern Santa Barbara County, south on the coastal slope to the vicinity of San Quintin, Baja California, Mexico. Localities on the eastern edge of its range include Jacumba and San Felipe Valley in San Diego County.

Habitat: Occurs primarily in open habitats including coastal sage scrub, chaparral, grasslands, croplands, and open, disturbed areas if there is at least some shrub cover present.

Status on site: One (1) individual was observed in the central portion of the site (Figure 4).

Sensitive Animals with Potential to Occur

Sensitive animal species with potential to occur on site are included in Appendix D. The species are grouped into invertebrates and vertebrates (amphibians, reptiles, birds, and mammals) and alphabetized (by scientific name). Refer to Appendix E for an explanation of status codes.

1.4.7 Wetlands/Jurisdictional Waters

Corps jurisdictional areas consist of 0.06 acre of road pools with fairy shrimp on site (Figure 5; Table 3). No CDFG jurisdictional area or County RPO wetlands occur on site. No Corps or CDFG jurisdictional areas or County RPO wetlands occur in the off-site improvement area.

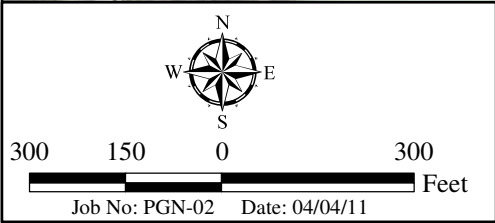
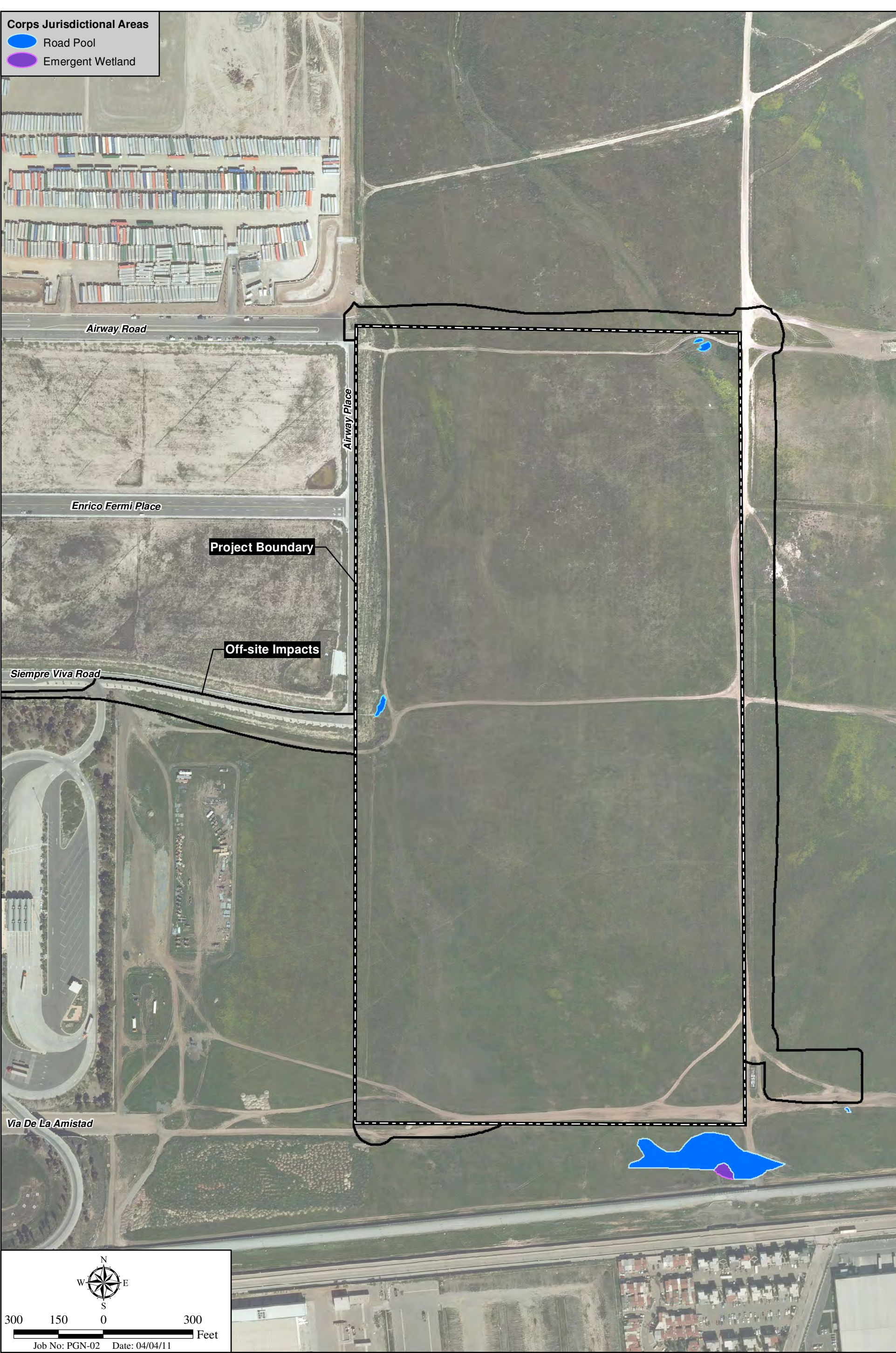
A small amount of southern willow scrub (0.08 acre) also occurs on site. Wetland vegetation was first mapped in this area in 2006, consisting of freshwater marsh with a few small, emergent willows. It occurs as a small depression at the base of an adjacent manufactured slope and receives runoff from this adjacent slope and graded pad through a brow ditch. Wetland vegetation established here following construction of Airway Place, with the willows growing taller and becoming dominant between 2008 and 2009. Water conveyed to this area collects on the edge of and within the adjacent road and then sheet flows into non-native grassland to the south; it does not flow into or otherwise connect with a drainage or streambed. As this area is a non-historic, artificially created, isolated feature, it is not considered Corps or CDFG jurisdictional or County RPO wetland. This area meets the criteria listed under RPO Section 86.602(q)(2) for areas that are not considered RPO wetlands because it (a) has wetland attributes solely due to man-made structures, (b) has negligible biological function or value as wetlands, (c) is small and geographically isolated from other wetland systems, (d) is not a vernal pool, and (e) it does not have substantial or locally important populations of wetland-dependent species. The southern willow scrub on site is still considered a sensitive vegetation community under CEQA, but is not a jurisdictional feature.

Table 3 EXISTING JURISDICTIONAL AREAS ON SITE (acre[s])*			
HABITAT	CORPS	CDFG	COUNTY RPO
Road pool with fairy shrimp	0.06	0.00	0.00
TOTAL	0.06	0.00	0.00

*Areas are presented in acre(s) rounded to the nearest 0.01.

Corps Jurisdictional Areas

- Road Pool
- Emergent Wetland



Job No: PGN-02 Date: 04/04/11

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Corps Jurisdictional Areas

HAWANO PROJECT

1.4.8 Habitat Connectivity and Wildlife Corridors

There are 2 types of wildlife corridors: local and regional. Local corridors provide animals with access to resources such as food, water, and shelter. Animals can use these corridors to travel from riparian to upland habitats and back. Regional corridors allow for animal movement between large core areas of habitat that are regionally important. They include major creeks and rivers, ridges, valleys, and large swaths of undeveloped land.

The project site is located in a portion of Otay Mesa characterized by non-native grassland that was historically in agriculture. Non-native grassland bounds the site to the immediate east, as well as to the north. The U.S./Mexico border is located just south of the site. Industrial and commercial development occurs to the west. The project site and immediate vicinity are subject to frequent patrolling by the Border Patrol, as well as off-road vehicle use. There is no connection for wildlife movement into Mexico, as (1) the border fence greatly inhibits wildlife movement, and (2) the City of Tijuana is entirely developed in the areas south of the project site. The project site does not support any vegetated riparian corridors that might be used for wildlife movement, nor does it connect to any such corridors off site. Although the site itself supports habitat that could be used by a wide variety of species, including coyote, bobcat, skunks, raccoons, and jackrabbits, it is not considered a wildlife corridor since the site does not concentrate animal movement and direct it toward any particular resource. Larger animals such as deer and mountain lion are not expected to use the site due to its relatively level terrain with little shrub cover combined with its proximity to urban development and frequent presence of vehicles and people on the site. For these reasons, the site is not considered to function as a local or regional wildlife corridor.

In addition, the project site is not included within the Major Amendment Areas of the MSCP, which typically include core habitat areas essential to many MSCP covered species. Rather, the project site is located within a Minor Amendment Area. Minor Amendment Areas typically support biological resources that could be partially or completely eliminated (with appropriate mitigation) without significantly affecting the overall goals of the County's Subarea Plan. As such, the project site does not contain biological resources that are critical for sensitive species within the Plan Area, and therefore does not comprise a substantial wildlife movement corridor.

1.5 APPLICABLE REGULATIONS

Biological resources within the project site are subject to regulatory review by the federal government, State of California, and County. The federal government administers non-marine plant- and wildlife-related issues through the USFWS, while the Corps administers Waters of the U.S. (including wetland and non-wetland) issues. California law relating to wetland, water-related, and wildlife issues is administered by CDFG. The County is the lead agency for the CEQA environmental review process in accordance with state law and local ordinances.

Coordination efforts for the proposed project to date consist of a pre-application meeting with staff from the County Department of Planning and Land Use on March 26, 2010.

Laws and regulations that apply include federal Endangered Species Act (ESA), Clean Water Act, CEQA, California Fish and Game Code, County MSCP Subarea Plan, RPO, and BMO. Under CEQA, impacts associated with a proposed project or program are assessed with regard to significance criteria determined by the CEQA Lead Agency (in this case, the County) and pursuant to CEQA and State CEQA Guidelines.

1.5.1 Federal Government

Administered by the USFWS, the federal ESA provides the legal framework for the listing and protection of species (and their habitats) that are identified as being endangered or threatened with extinction. Actions that jeopardize endangered or threatened species and the habitats upon which they rely are considered a ‘take’ under the ESA. Section 9(a) of the ESA defines take as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.” ‘Harm’ and ‘harass’ are further defined in federal regulations and case law to include actions that adversely impair or disrupt a listed species’ behavioral patterns.

Sections 7 and 10(a) of the federal ESA regulate actions that could result in take of endangered or threatened species. Section 7 describes a process of federal interagency consultation for use when federal actions may adversely affect listed species. A biological assessment is required for any major construction activity if it may affect listed species. In this case, take can be authorized via a letter of biological opinion, issued by the USFWS for non-marine related listed species issues. A Section 7 consultation (formal or informal) is required when there is a nexus between endangered species’ (in this case, the San Diego and Riverside fairy shrimp) use of the site and impacts to Corps jurisdictional areas. Section 10(a) allows issuance of permits for incidental take of endangered or threatened species with preparation of a habitat conservation plan (HCP). The term “incidental” applies if the taking of a listed species is incidental to, and not the purpose of, an otherwise lawful activity. An HCP demonstrating how the taking would be minimized and how steps taken would ensure the species’ survival must be submitted for issuance of Section 10(a) permits.

The USFWS identifies critical habitat for endangered and threatened species. Critical habitat is defined as areas of land that are considered necessary for endangered or threatened species to recover. The ultimate goal is to restore healthy populations of listed species within their native habitat so they can be removed from the list of threatened or endangered species. Once an area is designated as critical habitat pursuant to the federal ESA, all federal agencies must consult with the USFWS to ensure that any action they authorize, fund, or carry out is not likely to result in destruction or adverse modification of the critical habitat. Although a portion of the project site is located within designated critical habitat for San Diego fairy shrimp (22.8 acres), as well as 6 acres in the off-site improvement areas (Figure 6), no federal action is anticipated for this project, and as such, a formal Section 7 permit would not be required for the proposed project for impacts to critical habitat.

All migratory bird species that are native to the U.S. or its territories are protected under the federal Migratory Bird Treaty Act (MBTA), as amended under the Migratory Bird Treaty Reform Act of 2004 (FR Doc. 05-5127). The MBTA is generally protective of migratory birds but does not actually stipulate the type of protection required. In common practice, the MBTA is



Critical Habitat

HAWANO PARCEL

Figure 6

now used to place restrictions on disturbance of active bird nests during the nesting season (generally February 1 through September 1). In addition, the USFWS commonly places restrictions on disturbances allowed near active raptor nests.

Federal wetland regulation (non-marine issues) is guided by the Rivers and Harbors Act of 1899 and the Clean Water Act. The Rivers and Harbors Act deals primarily with discharges into navigable waters, while the purpose of the Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of all Waters of the U.S. Permitting for projects filling Waters of the U.S. (including wetlands) is overseen by the Corps under Section 404 of the Clean Water Act. Projects could be permitted on an individual basis or be covered under one of several approved Nationwide Permits. Individual Permits are assessed individually based on the type of action, amount of fill, etc. and typically require substantial time (often longer than 6 months) to review and approve, while Nationwide Permits are pre-approved if a project meets appropriate conditions.

1.5.2 State of California

Primary environmental legislation in California is found in CEQA and its implementing guidelines (State CEQA Guidelines), which require that projects with potential adverse effects (or impacts) on the environment undergo environmental review. Adverse environmental impacts are typically mitigated as a result of the environmental review process in accordance with existing laws and regulations.

The California ESA is similar to the federal ESA in that it contains a process for listing of species and regulating potential impacts to listed species. California ESA Section 2081 authorizes the CDFG to enter into a memorandum of agreement for the take of listed species for scientific, educational, or management purposes.

The Native Plant Protection Act (NPPA) enacted a process by which plants are listed as rare or endangered. The NPPA regulates collection, transport, and commerce in listed plants. The California ESA follows the NPPA and covers both plants and animals designated as endangered or threatened with extinction. Plants listed as rare under NPPA were also designated rare under the California ESA.

The California Fish and Game Code (Sections 1600 through 1603) requires a CDFG agreement for projects affecting riparian and wetland habitats through issuance of a Streambed Alteration Agreement. Since no CDFG jurisdictional areas occur on site, a Section 1602 Streambed Alteration Agreement would not be required.

1.5.3 County of San Diego

Multiple Species Conservation Program

The California Natural Communities Conservation Planning (NCCP) Act of 1991 (Section 2835) allows the CDFG to authorize take of species covered by plans in agreement with NCCP guidelines. A Natural Communities Conservation Program initiated by the State of California

focuses on conserving coastal sage scrub, and in concert with the USFWS and the federal ESA, is intended to avoid the need for future federal and state listing of coastal sage scrub dependent species.

The MSCP has been prepared to meet the requirements of the California NCCP, federal ESA, and California ESA. It is a comprehensive, long-term habitat conservation plan that addresses the needs of multiple species by identifying key areas for preservation as open space in order to link core biological areas into a regional wildlife preserve. The County's MSCP Subarea Plan (County 1997) implements the MSCP within the unincorporated areas under County jurisdiction.

County MSCP Subarea Plan

The project site is located within the South County Segment of the County's MSCP Subarea Plan. The entire site is designated as a Minor Amendment Area under the Subarea Plan (Figure 3). This designation was given because the location of preservation and development areas was not resolved during the MSCP process for lands within the South County Segment of the MSCP. It should be noted that within the entire County MSCP Subarea, Minor Amendment Areas total 2,051.7 acres. Because these Amendment Areas are not currently covered under the MSCP, the County's Take Authorizations do not apply to them until the amendment process has been completed. The Amendment process also requires that the protection of MSCP covered species be addressed. If a project satisfies the preservation requirements of the Federal and California ESAs and NCCP, then the MSCP can be amended to include the project site, and take authorization for covered species can be issued. The Minor Amendment designation is further discussed below.

Minor Amendment Areas

As described in the County MSCP Subarea Plan, Minor Amendment Areas "contain habitat that could be partially or completely eliminated (with appropriate mitigation) without significantly affecting the overall goals of the County's MSCP Subarea Plan." Minor Amendment Areas must meet the criteria and achieve the goals of linkages and corridors described in the County MSCP Subarea Plan and provide mitigation consistent with the BMO. Development within Minor Amendment Areas requires approval from the USFWS Field Office Supervisor, CDFG NCCP Program Manager, and County.

MSCP Covered Species

Most federally endangered species found locally are covered under the MSCP; however, the San Diego fairy shrimp and Riverside fairy shrimp are not currently covered by the Plan and impacts to these species require a USFWS consultation to receive take authorization. However, all proposed impacts to fairy shrimp are within the off-site impact area for the adjacent Otay Business Park (OBP; TM 5505) project for which a Section 7 Consultation has already been initiated. The USFWS does not issue take authorization for the same species in a given location more than once; hence, all proposed impacts to fairy shrimp will be addressed in the BO to be issued for the OBP project. Impacts to fairy shrimp will therefore be mitigated according to the conditions set forth in the Biological Opinion (BO) to be issued for the OBP project. For these reasons, the proposed project does not require a separate USFWS consultation for impacts to fairy shrimp.

The OBP is planned to move forward first and would be responsible for mitigating impacts to fairy shrimp on the Hawano site. If Hawano were to be constructed first it would be responsible for carrying out the measures identified in the BO for take of fairy shrimp on site.

Species observed during surveys of the property that are covered by the MSCP include 2 animal species (burrowing owl and northern harrier). Although burrowing owl is a covered species under the MSCP, impacts and mitigation must comply with the County's Burrowing Owl Strategy (County 2010). The proposed project conforms to the County's Burrowing Owl Strategy by proposing mitigation measures consistent with the strategy. These measures include not grading during the breeding season, conducting a pre-construction survey for owls during the non-breeding season, and implementing passive relocation measures if owls are present (non-breeding season only – no relocation during breeding season). Furthermore, the mitigation site would have the following characteristics:

- Support a sufficient acreage of grassland to meet the project requirements;
- Support or contain suitable habitat over the entire site to support burrowing owls;
- Be free of encumbrances that would preclude a conservation easement;
- Contribute to the long-term persistence of sensitive biological resources in the region; and
- Provide suitable habitat for multiple resources, including sensitive plant species, which could be transplanted or restored, if necessary.

In addition, a Resource Management Plan (RMP) would be prepared for the mitigation site and be approved by the County and Resource Agencies prior to project implementation.

Biological Mitigation Ordinance

The BMO is the mechanism by which the County implements the County MSCP Subarea Plan at the project level within the unincorporated area to attain the goals set forth in the County MSCP Subarea Plan. The BMO contains design criteria and mitigation standards which, when applied to projects requiring discretionary permits, protect habitats and species and ensure that a project does not preclude the viability of the MSCP Preserve System. In this way, the BMO promotes the preservation of lands that contribute to contiguous habitat core areas or linkages.

Under the BMO, habitat is considered a Biological Resource Core Area (BRCA) if it meets one of the following criteria:

- It is considered a preapproved mitigation area (PAMA) on the wildlife agencies' PAMA area map;
- It contains biological resources that support or contribute to the long-term survival of sensitive species and is adjacent to the pre-approved mitigation area;
- It is part of a regional linkage/corridor;
- It is mapped as Very High or High shown on the Habitat Evaluation Map and links significant patches of habitat;
- It is part of a block of habitat greater than 500 acres in area of diverse and undisturbed habitat that contributes to the conservation of sensitive species; or
- It supports a high number of sensitive species and is contiguous to undisturbed habitats.

The project site is considered a BRCA because it is part of a block of habitat greater than 500 acres and supports a high number of sensitive species.

County guidelines also direct that projects should incorporate avoidance of impacts to 80 percent of local populations of County Group A and B sensitive plants. However, no County Group A or B plants were recorded on site.

Resource Protection Ordinance

The County regulates natural resources (among other resources) via the RPO, the regulations of which cover wetlands, sensitive plants and animals, sensitive habitats, and habitats containing sensitive animals or plants as sensitive biological resources. Wetland habitats are defined per the RPO, as described in Section 2.2, above. Sensitive habitat lands are identified by the RPO as lands that “support unique vegetation communities, or habitats of rare or endangered species or sub-species of animals or plants as defined by Section 15380 of the CEQA Guidelines.” It is the intent of the RPO to increase the preservation and protection of the County’s unique topography, natural beauty, biological diversity, and natural and cultural resources.

2.0 PROJECT EFFECTS

Direct impacts are immediate impacts resulting from permanent habitat removal. Direct impacts were quantified by overlaying the limits of all project-related impacts on the biological resources map of the site. Indirect impacts are all actions that are not direct removal of habitat, but affect the surrounding biological resources either as a secondary effect of the direct impacts or as the cause of degradation of a biological resource over time. Projects can have a wide variety of indirect impacts, depending on the nature of the project, such as edge effects, animal behavioral changes, and errant construction. Cumulative impacts are those caused by numerous projects in the region and their additive effect of multiple direct and indirect impacts to biological resources over time.

2.1 SPECIAL STATUS PLANT SPECIES

As previously stated, approximately 631 individuals of small-flowered morning glory (a CNPS List 4.2 and County Group D species) were observed on site in 2010. The proposed project would impact all of the individuals of this species (Figure 7). No other sensitive plant species were observed on site during surveys.

2.2 SPECIAL STATUS ANIMAL SPECIES

As previously stated, 10 sensitive animal species were observed or detected on or immediately adjacent to the site during surveys. Project-related activities would result in impacts to locations of 9 sensitive animal species: San Diego fairy shrimp (a federal endangered, County Group 1 species), Riverside fairy shrimp (a federal endangered, County Group 1 species), western spadefoot (a state Species of Special Concern [SSC], County Group 2 species), burrowing owl (a Bird of Conservation Concern [BCC], SSC, County Group 1, and MSCP-covered species), California horned lark (a Watch List and County Group 2 species), grasshopper sparrow (an SSC

Off-site Impacts

Watershed

Vegetation

Road Pool

Southern Willow Scrub

Emergent Wetland

Non-native Grassland

Disturbed Habitat

Developed

Sensitive Resources

BUOW

Burrowing Owl (*Athene cunicularia*)

BUOW +B

Burrowing Owl + Burrow

HOLA

California Horned Lark (*Eremophila alpestris actia*)

GRSP

Grasshopper Sparrow (*Ammodramus savannerum*)

NOHA

Northern Harrier (*Circus cyaneus*)

LOSH

Loggerhead Shrike (*Lanius ludovicianus*)

RIFS

Riverside Fairy Shrimp (*Streptocephalus woottoni*)

BTJR

San Diego Black-tailed Jackrabbit (*Lepus californicus bennettii*)

SDFS

San Diego Fairy Shrimp (*Branchinecta sandiegonensis*)

TUVU

Turkey Vulture (*Cathartes aura*)

WESP

Western Spadefoot Toad (*Spea hammondi*)

Cs

Small-flowered Morning Glory (*Convolvulus simulans*)

Map showing Vegetation and Sensitive Resources/Impacts for the Hawano Project. The map includes a legend for Vegetation (Road Pool, Southern Willow Scrub, Emergent Wetland, Non-native Grassland, Disturbed Habitat, Developed) and Sensitive Resources (BUOW, BUOW +B, HOLA, GRSP, NOHA, LOSH, RIFS, SDFS, TUVU, WESP, Cs). The map displays the project boundary, surrounding roads (Airway Road, Enrico Fermi Place, Siempre Viva Road, Airway Place, Hawano Drive North, Hawano Drive South, Via de la Amistad, Alta Road), and various sensitive resource locations (e.g., BUOW, BUOW +B, HOLA, GRSP, NOHA, LOSH, RIFS, SDFS, TUVU, WESP, Cs). Matchlines are indicated on the left and right sides. A scale bar and north arrow are provided in the bottom left corner.

Vegetation and Sensitive Resources/Impacts

HAWANO PROJECT

HELIX
Environmental Planning

Figure 7

and County Group 1 species), northern harrier (an SSC, County Group 1, and MSCP-covered species), San Diego black-tailed jackrabbit (an SSC and County Group 2 species), and turkey vulture (a County Group 1 species).

In addition, project implementation would impact potential foraging and/or nesting habitat of the remaining 1 sensitive animal species: loggerhead shrike (a BCC, SSC, County Group 1 species).

2.3 RIPARIAN HABITAT OR SENSITIVE NATURAL COMMUNITY

The proposed project would result in direct impacts to approximately 83.2 acres of sensitive vegetation communities: 0.06 acre of road pools with San Diego fairy shrimp and/or Riverside fairy shrimp (on site), 0.08 acre of southern willow scrub (on site), and 83.1 acres of non-native grassland (73.9 acres on site and 9.2 acres off site; Figure 7; Table 4).

Table 4 IMPACTS TO VEGETATION COMMUNITIES			
Vegetation Community/Habitat*	Acre(s) [‡]		
	On Site	Off Site	TOTAL
Road pool with fairy shrimp (no code)	0.06	0.00	0.06
Southern willow scrub (63320)	0.08	0.00	0.08
Non-native grassland (42200)	73.9	9.2	83.1
Disturbed habitat (11300)	2.9	1.6	4.5
Developed land (12000)	2.1	1.9	4.0
TOTAL	79.0	12.7	91.7

*Vegetation categories and numerical codes are from Holland (1986) and Oberbauer (2008)

[‡]Upland habitats are rounded to the nearest 0.1 acre, while wetland habitats are rounded to the nearest 0.01; thus, totals reflect rounding

2.4 JURISDICTIONAL WETLANDS AND WATERWAYS

The proposed project would impact 0.06 acre of road pools with listed fairy shrimp that are Corps jurisdictional (Figure 8). No impacts to CDFG jurisdictional areas or County RPO wetlands would result from project implementation.

Table 5 IMPACTS TO JURISDICTIONAL AREAS (acre[s])*			
HABITAT	CORPS	CDFG	COUNTY RPO
Road pool with fairy shrimp (no code)	0.06	0.00	0.00
TOTAL	0.06	0.00	0.00

*Areas are presented in acre(s) rounded to the nearest 0.01.

2.5 WILDLIFE MOVEMENT AND NURSERY SITES

The site is not part of a regional or local corridor and does not serve as a nursery site.

2.6 INDIRECT IMPACTS

Potential indirect impacts include night lighting, noise, colonization by invasive species, fugitive dust, habitat insularization, and human activity/domestic animals, and are further described below.

2.6.1 Lighting

Night lighting on native habitats can prevent nocturnal wildlife from using an area. Night lighting could cause an increased loss in native wildlife as it could provide nocturnal predators with an unnatural advantage over their prey. All proposed project-related lighting would be required to adhere to Division 9 of the San Diego County Light Pollution Code. Lighting within the proposed project footprint adjacent to undeveloped habitat would be of the lowest illumination allowed for human safety, selectively placed, shielded, and directed away from these areas.

2.6.2 Noise

Construction-related noise from such sources as clearing and grading would be a temporary impact to wildlife. Breeding birds and mammals may temporarily or permanently leave their territories to avoid disturbances from construction activities, which could lead to reduced reproductive success and increased mortality. Potential short-term noise impacts could result from construction for the proposed project. Noise effects would be considered significant if construction noise levels exceed a level of 60 dB L_{eq} hourly average or ambient adjacent to tree or ground nesting raptor habitat during the breeding season for tree-nesting raptors (January 15 to July 15) or ground-nesting raptors (February 1 to July 15).

2.6.3 Colonization by Invasive Species

Non-native plants could colonize sites disturbed by construction and could potentially spread into the adjacent proposed open space. Many of these non-native plants are highly invasive and can displace native vegetation, may increase flammability and/or fire frequency, change ground and surface water levels, and potentially adversely affect native wildlife dependent upon native vegetation.

2.6.4 Fugitive Dust

Fugitive dust produced by construction has the potential to disperse onto preserved vegetation, which may reduce the overall vigor of individual plants by reducing their photosynthetic capabilities and increasing their susceptibility to pests or disease. This in turn could affect animals dependent on these plants (e.g., seed-eating rodents). Fugitive dust also may make plants unsuitable as habitat for insects and birds. Breeding birds and mammals may temporarily or permanently leave their territories to avoid construction, which could lead to reduced reproductive success and increased mortality. Active construction areas as well as unpaved



Corps Jurisdictional Areas/Impacts

HAWANO PROJECT

surfaces would be watered pursuant to County grading requirements to minimize dust generation.

2.6.5 Habitat Insularization

Habitat insularization is the fragmentation of large habitat areas into smaller islands effectively isolated from one another. Such fragmentation presents barriers to wildlife movement and breeding, splits animal and plant populations, and increases edge effects. Often, habitat insularization is associated with local species extinctions, since smaller habitat areas support relatively fewer species than larger ones.

2.6.6 Human Activity/Domestic Animals

Increases in human activity in the area could result in illegal dumping of landscape debris, trash, and other refuse as well as an increase in domestic animals (i.e., dogs and cats). Human activity and an increase in domestic animals could result in an increase in mortality to avian or small mammal species.

3.0 SPECIAL STATUS SPECIES

3.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the USFWS or CDFG (County 2009b)?

Any of the following conditions would be considered significant if:

- A. The project would impact 1 or more individuals of a species listed as federally or state endangered or threatened.
- B. The project would impact an on-site population of a County Group A or B plant species, or a County Group 1 animal, or a species listed as a state Species of Special Concern. Impacts of less than 5 percent of the individual plants or of the sensitive species habitat on a project site could be considered less than significant only if a biologically-based determination can be made that the project would not have a substantial adverse effect on the local long-term survival of that plant or animal taxon. Impacts to 5 percent or more of the population on a project site are generally considered significant.
- C. The project would impact the local long-term survival of a County Group C or D plant species or a County Group 2 animal species.
- D. The project may impact arroyo toad aestivation or breeding habitat.
- E. The project would impact golden eagle habitat.

- F. The project would result in a loss of functional foraging habitat for raptors.
- G. The project would increase noise and/or nighttime lighting to a level above ambient proven to adversely affect sensitive species.
- H. The project would impact the viability of a core wildlife area, defined as a large block of habitat (typically 500 acres or more not limited to project boundaries, though smaller areas with particularly valuable resources may also be considered a core wildlife area) that supports a viable population of a sensitive wildlife species or an area that supports multiple wildlife species.
- I. The project would increase human access or predation or competition from domestic animals, pests or exotic species to levels that would adversely affect sensitive species.
- J. The project would impact nesting success of sensitive animals (as listed in the Guidelines for Determining Significance) through grading, clearing, fire fuel modification, and/or noise generating activities such as construction.

3.2 ANALYSIS OF PROJECT EFFECTS

The proposed project would result in significant impacts under the above guidelines for the following reasons:

- 3.1.A Implementation of the proposed project would impact road pools supporting San Diego and Riverside fairy shrimp (both federally endangered species; Figure 7) and San Diego fairy shrimp critical habitat. Impacts to San Diego and Riverside fairy shrimp would be significant under County Guideline 3.1.A.
- 3.1.B As discussed above in Section 2.0, implementation of the proposed project would impact habitat that is known to be used by five County Group 1 animal species, consisting of burrowing owl, grasshopper sparrow, northern harrier, turkey vulture, and loggerhead shrike. Because the project would impact greater than five percent of the habitat used by these species, impacts would be considered significant under County Guideline 3.1.B. No impacts to County Group A or B plant species would occur.
- 3.1.C Implementation of the proposed project would impact approximately 631 individuals of small-flowered morning glory. Small-flowered morning glory is a low sensitivity (CNPS List 4.2, County Group D) species that is widely distributed (occurs through much of coastal California from Contra Costa County south into Baja), and has several scattered observations in San Diego County (San Diego Natural History Museum Plant Atlas 2010), including other observations in the Otay area. Due to the relatively large population on site and unknown numbers of individuals on other parcels in the Otay area, it was determined that impacts to all individuals occurring on the project site would be a significant impact to County Group D plant species under County Guideline 3.1.C.

- 3.1.E A golden eagle pair is known to nest in O'Neal Canyon off site to the northeast and the project site lies within the pair's foraging area. The site does not support suitable nesting habitat for this species and the project would only impact foraging habitat. Impacts to eagle foraging habitat would be considered significant under County Guideline 3.1.E.
- 3.1.F The project site supports raptor foraging habitat. Impacts to 83.1 acres of non-native grassland would occur and would be significant under County Guideline 3.1.F.
- 3.1.G Potential short-term noise impacts could result from construction for the proposed project. Noise effects would be considered significant if construction noise levels exceed a level of 60 dB L_{eq} hourly average or ambient adjacent to ground nesting raptor nests during the breeding season for ground-nesting raptors (February 1 to July 15). No habitat for tree nesting raptors occurs on or adjacent to the project site.

The proposed project would not result in significant impacts under the above guidelines for the following reasons:

- 3.1.C Implementation of the proposed project would impact locations where the following County Group 2 animal species were observed/detected: western spadefoot (1 location) California horned lark (1 location), and San Diego black-tailed jackrabbit (1 location; Figure 4). The local long-term survival of these 3 animal species is not expected to be impacted by implementation of the proposed project. The western spadefoot toad has been reported in a relatively large number of locations on Otay Mesa, many of which provide higher quality habitat (open sage scrub as opposed to grassland) than that provided on the project site. As such, project implementation is not expected to have an adverse effect on the local long-term survival of this species. California horned lark and San Diego black-tailed jackrabbit also have been reported in many locations in the Otay region and project implementation also is not expected to impact their local long-term survival. Under County Guidelines 3.1.C, no significant impact to County Group 2 animal species would occur.
- 3.1.D The site contains no habitat suitable for the arroyo toad.
- 3.1.G All proposed project-related lighting would be required to adhere to Division 9 of the San Diego County Light Pollution Code. Lighting within the proposed project footprint adjacent to undeveloped habitat would be of the lowest illumination allowed for human safety, selectively placed, shielded, and directed away from these areas. Under County Guideline 3.1.G, no significant impact resulting from lighting would occur. For the discussion of noise, see 3.1.G, above.
- 3.1.H The project site is not part of a core wildlife area.
- 3.1.I Because nearly the entire project site and most of the surrounding area is characterized by non-native grassland, spread of non-native plant species during construction is not anticipated

to cause a significant impact. To avert potentially significant impacts from plants installed as part of the project, only non-invasive plant species would be included in the landscape plan for the site (species not listed on the California Invasive Plant Inventory prepared by the California Invasive Plant Council [Cal-IPC; 2006]). Increases in human activity in the area are unlikely to further degrade habitat, as the site is currently accessible via multiple dirt roads. Project development would likely aid in curtailing access to adjacent undeveloped areas. Because the project is not a residential development, impacts from domestic animals are not expected to occur. Under County Guideline 3.1.I, no significant impact would occur.

- 3.1.J As previously stated, fugitive dust produced by construction has the potential to disperse onto vegetation adjacent to the project site, which may reduce the overall vigor of individual plants by reducing their photosynthetic capabilities and increasing their susceptibility to pests or disease. Active construction areas as well as unpaved surfaces would be watered pursuant to County grading requirements to minimize dust generation. Under County Guideline 3.1.J, no significant impact would occur.

3.3 CUMULATIVE IMPACT ANALYSIS

Although individual environmental effects of a project may be determined to be insignificant when analyzed separately, the additive effect when viewed in connection with impacts of past, present, and future projects may cause the significant loss or degradation of a resource.

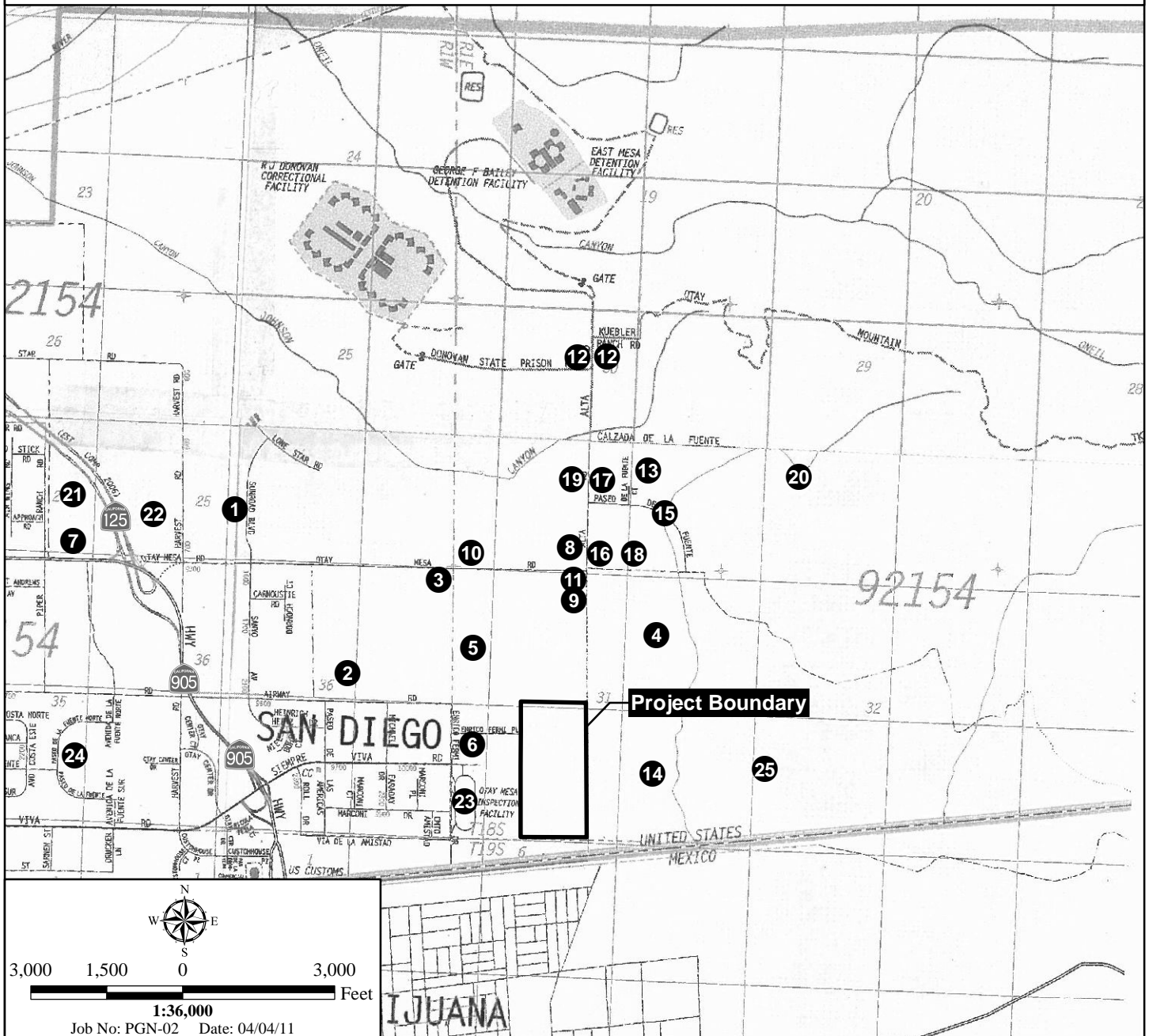
The area of consideration for cumulative biological projects impacts was restricted to projects occurring on Otay Mesa within the County, generally east of State Route 125 (except for 1 project) and south of Kuebler Ranch Road.

A total of 26 projects (including the proposed project) were reviewed for this cumulative analysis (Figure 9; Table 6). Of these 26 cumulative projects, 23 would result in significant or potentially significant cumulative impacts to sensitive biological resources. The remaining 3 projects either would not result in impacts to sensitive biological resources or information on impacts is not available.

The 23 cumulative projects (including the proposed project) with available data would impact 22 locations where burrowing owl burrows were observed and 1,431.2 acres of raptor foraging habitat (non-native grassland). The proposed project would result in impacts to 2 burrowing owl burrows and 83.1 acres of raptor foraging habitat (non-native grassland).

Cumulatively significant impacts would occur to burrowing owl, northern harrier, and turkey vulture since the project would further reduce the amount of foraging habitat available for these species. According to the EOMSP Final Environmental Impact Report (FEIR; County 1994), impacts to non-native grassland constitute a significant cumulative impact due to loss of raptor foraging habitat. However, since the approval of the EOMSP, the MSCP has been approved, which addresses impacts to biological resources on a regional basis and provides for long-term conservation of species addressed in the EOMSP FEIR. This, combined with off-site habitat preservation, results in impacts that are considered cumulatively significant but mitigable.

- | | |
|--|---|
| 1 Sunroad Centrum Tech Center | 14 Otay Business Park (Paragon) |
| 2 Saeed TM/Airway Business Center | 15 Paseo De La Fuente |
| 3 Enrico Fermi Industrial Park | 16 Border Patrol Site Grading Plan (East Otay Mesa Parcel B Grading Plan) |
| 4 Otay Crossings Commerce Park | 17 Power Plant Laydown Site |
| 5 Otay Mesa Travel Plaza | 18 Vulcan Site Grading Plan |
| 6 Burke Minor Subdivision/Otay Logistics Center | 19 Corrections Corporation of America |
| 7 Pilot Travel Center | 20 Otay Hills |
| 8 Aaron Construction Auto Auction Park | 21 Piper Otay Park |
| 9 East Otay Temporary Fire Facility | 22 California Crossings |
| 10 Otay Mesa Auto Transfer/Rowland | 23 Rapid Transfer Express |
| 11 Bradley/Robertson Copart Salvage Auto Auctions | 24 Vulcan Batching Plant |
| 12 National Enterprises Storage and Recycling Facility | 25 SR-11 and Otay Mesa East Port of Entry |
| 13 Otay Mesa Generating Project (Calpine) | |



Cumulative Projects

HAWANO PARCEL

Figure 9

Cumulative impacts to listed species (San Diego fairy shrimp and Riverside fairy shrimp) would occur as the project would contribute to the regional loss of suitable habitat for these species. However, these impacts would be reduced to a level below significance through off-site vernal pool habitat restoration and preservation and salvage and translocation of fairy shrimp inoculum to the preservation area, which would result in (1) higher quality habitat for these species compared to the impacted areas, (2) preservation in perpetuity of these habitats, and (3) connectivity to other preserved lands.

Cumulatively significant impacts would occur to the four following species not covered by the County's MSCP Subarea Plan (California horned lark, loggerhead shrike, grasshopper sparrow, and San Diego black-tailed jackrabbit) since the project would contribute to the incremental loss of grassland habitat in the region. These impacts would be significant but mitigated to less than significant through habitat-based mitigation.

Although not significant at the project level, cumulatively significant impacts would occur to the western spadefoot toad since the project would contribute to the overall loss of suitable breeding habitat in the region. These impacts would be significant but mitigated to less than significant through off-site habitat-based mitigation.

Impacts to small-flowered morning glory (631 individuals) are not considered cumulatively significant due to the low sensitivity and wide distribution of this species.

The proposed project would preserve 83.1 acres of raptor foraging habitat (non-native grassland) as well as providing species-specific mitigation for fairy shrimp and burrowing owl, and habitat-based mitigation for other significantly impacted species. Therefore, the proposed project's impacts to these species, while significant at the project level, are fully mitigated through acquisition of appropriate habitat off site, restoration, and/or translocation of individuals. As the project would ultimately be in conformance with the MSCP, cumulative impacts would be considered fully mitigated.

Table 6
CUMULATIVE BIOLOGICAL RESOURCES IMPACTS

Map Reference No.	Project Number	Project Name	Resource					
			Wetland/Riparian		Non-Native Grassland		Burrowing Owl	
			Impacts	Mitigation	Impacts	Mitigation	Impacts	Mitigation
1	TM 5139 MUP 98-020 STP 02-05139-1	Sunroad Centrum Tech Center	0.52	0.64	171	54	0	0
2	TM 5304	Saeed TM/ Airway Business Center	0	0	38.5	19.3	0	0
3	TM 5394	Enrico Fermi Industrial Park	NA	NA	NA	NA	NA	NA
4	TM 5405	Otay Crossings Commerce Park	0.73	0.76	263.3	263.3	Yes	Yes
5	TPM 20414 MUP 98-024 MUP Modification 98-024-01	Otay Mesa Travel Plaza	NA	NA	73.5	73.5	NA	NA
6	TPM 20701RPL1 ZAP 99-029 STP 05-018	Burke Minor Subdivision/Otay Logistics Center	0	0	40.0	20.0	0	0
7	STP 05-021	Pilot Travel Center	0	0	12.9	6.5	0	0
8	MUP 00-012 Minor Deviation 00-012-02	Aaron Construction Auto Auction Park	0	0	33.4	16.7	0	0
9	STP 00-070	East Otay Temporary Fire Facility	0	0	0	0	0	0
10	MUP 03-001	Otay Mesa Auto Transfer/Rowland	0	0	8.0	4.0	0	0

Table 6 (cont.)
CUMULATIVE BIOLOGICAL RESOURCES IMPACTS

Map Reference No.	Project Number	Project Name	Resource					
			Wetland/Riparian		Non-Native Grassland		Burrowing Owl	
			Impacts	Mitigation	Impacts	Mitigation	Impacts	Mitigation
11	MUP 88-020 STP 00-070	Bradley/Robertson Copart Salvage Auto Auctions	0	0	0	0	0	0
12	MUP 98-001 RPL1	National Enterprises Storage and Recycling Facility	0	0	103.6	24.3	NA	NA
13	TPM 20570	Otay Mesa Generating Project (Calpine)	0	0	63.5	35.9	0	0
14	TM 5505	Otay Business Park (Paragon)	0.25	0.97	163.34	163.34	7 burrows	Yes
15	CG 4530	Paseo De La Fuente	0.34	0.68	12.0	6.0	0	0
16	L 14456	Border Patrol Site Grading Plan (East Otay Mesa Parcel B Grading Plan)	0	0	17.7	8.86	0	0
17	L 14208	Power Plant Laydown Site	0	0	13.5	6.8	0	0
18	L 14625	Vulcan Site Grading Plan	0	0	10.9	5.5	0	0
19	P06-074 (MUP 06-074) SPA 05-005	Corrections Corporation of America	0	0	36.7	36.7	0	0

Table 6 (cont.)
CUMULATIVE BIOLOGICAL RESOURCES IMPACTS

Map Reference No.	Project Number	Project Name	Resource					
			Wetland/Riparian		Non-Native Grassland		Burrowing Owl	
			Impacts	Mitigation	Impacts	Mitigation	Impacts	Mitigation
20	MUP 04-004 RP 04-001	Otay Hills Construction Aggregate Extraction Operation	0.31	0.93	29.4	24.7	1 burrow	Yes
21	TM 5527	Piper Otay Park	0	0	23.4	23.4	0	0
22	TPM 21046, MUP06-102, 93-19-006AA	California Crossings	0	0	23.4	12.75	0	0
23	S08-022	Rapid Transfer Express	0	0	14.6	15.0	0	0
24	L 14625	Vulcan Batching Plant	0	0	10.9	5.45	0	0
25	PM 0.0/2.7, EA056300	SR-11 and East Otay Mesa Port of Entry	0.42	0.84	184.6	184.8	12 burrows	Yes
Subtotal	--	--	2.57	4.82	1,348.1	1,010.8	20 burrows	Yes
Proposed Project	TM 5566 Environmental Log No. 93-19-006OO	Hawano	0.08	0.08	83.1	83.1	2 burrows	Yes
TOTAL	--	--	2.65	4.90	1,431.2	1,093.9	22 burrows	Yes

TM = Tentative Map; TPM = Tentative Parcel Map; STP = Site Plan; MPA = Major Pre-Application; MUP = Major Use Permit; RP = Reclamation Plan; ZAP = Minor Use Permit; RPL = Replacement; SPA = Specific Plan Amendment; NA = Information Not Available or Not Applicable.

3.4 MITIGATION MEASURES AND DESIGN CONSIDERATIONS

The following mitigation measures are recommended to reduce the impacts to special status species to less than significant.

Impact 3.4.1 Implementation of the proposed project would impact San Diego and Riverside fairy shrimp.

*Mitigation Measure
(MM) 3.4.1*

Mitigation for impacts to 0.06 acre of habitat supporting the federally endangered San Diego fairy shrimp and federally endangered Riverside fairy shrimp will occur at a 5:1 ratio through off-site restoration and/or preservation of 0.30 acre of vernal pool habitat at Lonestar Ridge, including translocation of soil inoculum. The impacted pools are within the off-site impact area for the adjacent Otay Business Park project (OBP; TM 5505), and are anticipated to receive take authorization through this project and mitigated according to the conditions set forth in the Biological Opinion (BO) to be issued for the OBP project. A Section 7 Consultation has been initiated for these impacts and a Vernal Pool Preserve Restoration Plan has been prepared for the OBP project (Appendix H; HELIX 2011b) and submitted to the County and resource agencies for review and approval. Should the OBP project not move forward ahead of the proposed project, the proposed project would mitigate for the 0.06 acre of onsite road pools according to the conditions set forth in the BO for OBP. The proposed project will be conditioned to complete its portion of all required mitigation for impacts to fairy shrimp pursuant to the Vernal Pool Preserve Restoration Plan (Appendix H) or to provide evidence that mitigation totaling 0.30 acre of vernal pools has been completed through off-site restoration and/or preservation in accordance with the restoration plan. The restoration carried out will be limited only to that required for the fairy shrimp/pool impacts of the Hawano project and will not include other efforts identified in the plan (grassland dethatching, mowing, artificial owl burrows, QCB locations, etc.). The proposed project also will be conditioned to demonstrate that take authorization has already been issued for these impacts.

Impact 3.4.2 Implementation of the proposed project would impact raptor foraging habitat (83.1 acres of non-native grassland), including foraging habitat for golden eagle.

MM 3.4.2 Mitigation for impacts to raptor foraging habitat will occur at a 1:1 ratio through off-site preservation of grassland habitat in conjunction with the mitigation for non-native grassland impacts (MM 4.4.1c).

- Impact 3.4.3* Construction-related noise may significantly impact raptors that may be nesting within 300 feet of the construction area such that construction noise at the nest exceeds 60 dB L_{eq} .
- MM 3.4.3a* No grubbing, clearing, or grading within 300 feet of an active raptor nest during the raptor-breeding season (February 1 to July 15) will occur. As such, all grading permits, improvement plans, and the final map will state the same. If grubbing, clearing, or grading would occur during the raptor-breeding season, a pre-grading survey will be conducted within 3 days prior to grading to determine if raptors occur within the areas directly impacted by grading or indirectly impacted by noise. If there are no raptors nesting (includes nest building or other breeding/nesting behavior) within this area, development will be allowed to proceed. However, if raptors are observed nesting or displaying breeding/nesting behavior within the area, construction will be postponed until (1) all nesting (or breeding/nesting behavior) has ceased or until after July 15; or (2) a temporary noise barrier or berm will be constructed at the edge of the development footprint to reduce noise levels below 60 dB L_{eq} or ambient (if ambient is greater than 60 dB L_{eq}). Alternatively, the duration of construction equipment operation could be controlled to keep noise levels below 60 dB L_{eq} or ambient in lieu of or in concert with a wall or other sound attenuation barrier.
- MM 3.4.3b* No grading may occur within occupied burrowing owl habitat during the burrowing owl breeding season (February 1 through August 31). Outside the breeding season, a pre-construction survey to identify the known active burrows would be conducted no more than seven days prior to initiation of construction. Weed removal (by whacking, bush hogging, or mowing) would be conducted, under the guidance of a qualified biological monitor, to make all potential burrows more visible to avoid injuring owls by burrow collapse. If owls were present in the burrows, a qualified biologist would implement passive relocation measures (installation of one-way doors) in accordance with CDFG regulations (CDFG 1995). Once all owls have vacated the burrows (approximately 48 hours), a qualified biologist would oversee the excavation and filling of the burrows.
- Impact 3.4.4* The project would impact 631 individuals of small-flowered morning glory, a CNPS List 4.2 and County Group D species.
- MM 3.4.4* Impacts to small-flowered morning glory would be mitigated through preservation of off-site grassland habitat suitable for supporting this species. The preserved habitat will be part of the area to be preserved as mitigation for impacts to non-native grassland and raptor foraging habitat.

3.5 CONCLUSION

Implementation of the proposed project would directly impact 1 sensitive plant species and 9 sensitive animal species. In addition, indirect impacts as a result of loss of habitat and/or noise could occur to 10 sensitive animal species. If implemented, the recommended mitigation measures would reduce these impacts to below a level of significance.

4.0 RIPARIAN HABITAT OR SENSITIVE NATURAL COMMUNITY

4.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the USFWS or CDFG (County 2009b)?

Any of the following conditions would be considered significant if:

- A. Project-related grading, clearing, construction or other activities would temporarily or permanently remove sensitive native or naturalized habitat (as listed in Table 5 in the County Biological Guidelines, excluding those without a mitigation ratio) on or off the project site.
- B. Any of the following will occur to or within jurisdictional wetlands and/or riparian habitats as defined by the Corps, CDFG, and County: vegetation removal; grading; obstruction or diversion of water flow; adverse change in velocity, siltation, volume of flow, or runoff rate; placement of fill; placement of structures; road crossing construction; placement of culverts or other underground piping; any disturbance of the substratum; and/or any activity that may cause an adverse change in native species composition, diversity and abundance.
- C. The project would draw down the groundwater table to the detriment of groundwater-dependent habitat, typically a drop of 3 feet or more from historical low groundwater levels.
- D. The project would increase human access or competition from domestic animals, pests or exotic species to levels proven to adversely affect sensitive habitats.
- E. The project does not include a wetland buffer adequate to protect the functions and values of existing wetlands.

4.2 ANALYSIS OF PROJECT EFFECTS

The proposed project would result in significant impacts under the above guidelines for the following reasons:

- 4.1.A As discussed above, implementation of the proposed project would result in direct impacts to approximately 83.2 acres of sensitive vegetation communities: 0.06 acre of road pools with San Diego and/or Riverside fairy shrimp, 0.08 acre of southern willow scrub, and 83.1 acres of non-native grassland (Figure 7; Table 4). These impacts would be significant according to County Guideline 4.1.A.
- 4.1.B As discussed in Section 2.4, implementation of the proposed project would result in impacts to 0.06 acre of Corps jurisdictional areas (road pools with fairy shrimp; Figure 8; Table 5). This impact would be significant according to County Guideline 4.1.B.

The proposed project would not result in significant impacts under the above guidelines for the following reasons:

- 4.1.C No groundwater withdrawals or activities that could result in lowering of the groundwater table are proposed. Under County Guideline 4.1.C, no significant impact would occur.
- 4.1.D Invasive plant species included in the California Invasive Plant Inventory prepared by Cal-IPC (2006) would not be installed on site. Under County Guideline 4.1.D, no significant impact would occur.
- 4.1.E No wetlands occur adjacent to the project site.

4.3 CUMULATIVE IMPACT ANALYSIS

The 26 cumulative projects (including the proposed project) with available data would result in impacts to 2.65 acres of riparian/wetland habitats and 1,431.2 acres of non-native grassland. The proposed project's impacts to 0.08 acre of southern willow scrub habitat would be fully mitigated by purchase of credits in the Rancho Jamul Wetland Mitigation Bank. It also should be noted that this wetland habitat on site is the result of irrigation runoff from a manufactured slope and not a historical or jurisdictional feature. The proposed project's impacts to 83.1 acres of non-native grassland, while significant at the project level, are fully mitigated through off site preservation of grassland habitat at a 1:1 ratio; thus significant cumulative impacts would not occur from implementation of the project.

4.4 MITIGATION MEASURES AND DESIGN CONSIDERATIONS

Impact 4.4.1a-c Implementation of the proposed project would result in direct impacts to approximately 83.2 acres of sensitive vegetation communities: 0.06 acre of road pools with San Diego and/or Riverside fairy shrimp, 0.08 acre of southern willow scrub, and 83.1 acres of non-native grassland.

MM 4.4.1a Implementation of MM 3.4.1 would mitigate for impacts to road pools with fairy shrimp.

MM 4.4.1b Mitigation for impacts to 0.08 acre of non-jurisdictional southern willow scrub will occur at a 1:1 ratio through purchase of credits at the Rancho Jamul Wetland Mitigation Bank.

MM 4.4.1c Impacts to non-native grassland will be mitigated at a 1:1 ratio in accordance with the County's burrowing owl strategy (County 2010). The mitigation will consist of 83.1 acres of non-native grassland habitat preserved off site. Per the County's strategy, this may occur through a combination of on- and off-mesa preservation. An RMP for the off-site burrowing owl occupied non-native grassland habitat mitigation also will be prepared and submitted for County and Wildlife Agency review once the location of this mitigation is identified.

A total of 17.2 acres of the proposed project's non-native grassland impacts overlap with the OBP project impacts. If OBP is implemented first the proposed project would not impact this habitat and the corresponding mitigation requirement would be reduced accordingly. If the Hawano project is implemented ahead of OBP, then Hawano may use 17.2 acres of non-native grassland habitat at the Lonestar site as partial mitigation. The remaining 65.9 acres would be mitigated by the proposed project per the County's strategy. An RMP for mitigation occurring at Lonestar Ridge has been prepared as part of the OBP project (Appendix I [HELIX 2011c]) and is anticipated to be carried out by the OBP project. If the Hawano project uses a portion of Lonestar for its non-native grassland mitigation needs then it also will implement its respective portion of the Lonestar Ridge RMP. Other management requirements in the RMP not directly associated with the preservation of 17.2 acres of non-native grassland would not be implemented.

Impact 4.4.2a Mitigation for impacts to 0.06 acre of Corps jurisdictional areas (road pools with fairy shrimp) would occur upon project implementation.

MM 4.4.2a Impacts to Corps jurisdictional areas (i.e., road pools with fairy shrimp) will be mitigated at a 5:1 ratio and total 0.30 acre (Table 7) as described in MM 3.4.1 and 4.4.1a.

Table 7
IMPACTS AND MITIGATION
FOR CORPS JURISDICTIONAL AREAS (acre[s])¹

HABITAT	IMPACTS*	RATIO	MITIGATION*
Road pools with fairy shrimp	0.06	5:1	0.30
TOTAL	0.06	--	0.30

*Impacts and mitigation will be processed through the OBP project, as discussed under MM 3.4.1 and 4.4.1a.

4.5 CONCLUSION

Implementation of the proposed project would result in significant impacts to sensitive natural communities, including jurisdictional areas; however, mitigation measures for loss of habitat resulting from implementation of the project would reduce impacts to below a level of significance. Mitigation includes off-site preservation at ratios consistent with those required by the County and resource agencies.

5.0 JURISDICTIONAL WETLANDS AND WATERWAYS

5.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

5.1.A Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption or other means (County 2009b)?

5.2 ANALYSIS OF PROJECT EFFECTS

As previously stated in Sections 2.4 and 4.2, implementation of the proposed project would result in impacts to 0.06 acre of road pools with fairy shrimp under the jurisdiction of the Corps (Figure 8; Table 7).

5.3 CUMULATIVE IMPACT ANALYSIS

The proposed project's impacts to 0.06 acre of Corps jurisdictional areas, while significant at the project level, would be fully mitigated by off-site restoration and/or preservation of vernal pool habitat, and translocation of soil inoculum to the preservation site. Given that mitigation would occur at a ratio of 5:1, there would be no net loss of Corps jurisdictional areas, and therefore no cumulatively significant impact would occur.

5.4 MITIGATION MEASURES AND DESIGN CONSIDERATIONS

Implementation of MM 4.4.1a would mitigate for impacts to Corps jurisdictional areas.

5.5 CONCLUSION

Implementation of the proposed project would result in significant impacts to Corps jurisdictional areas; however, mitigation measures, as determined by the Corps, would reduce impacts to below a level of significance.

6.0 WILDLIFE MOVEMENT AND NURSERY SITES

6.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites (County 2009b)?

Any of the following conditions would be considered significant if:

- A. The project would prevent wildlife access to foraging habitat, breeding habitat, water sources, or other areas necessary for their reproduction.
- B. The project would substantially interfere with connectivity between blocks of habitat, or would potentially block or substantially interfere with a local or regional wildlife corridor or linkage.
- C. The project would create artificial wildlife corridors that do not follow natural movement patterns.
- D. The project would increase noise and/or nighttime lighting in a wildlife corridor or linkage to levels proven to affect the behavior of the animals identified in a site-specific analysis of wildlife movement.
- E. The project does not maintain an adequate width for an existing wildlife corridor or linkage and/or would further constrain an already narrow corridor through activities such as (but not limited to) reduction of corridor width, removal of available vegetative cover, placement of incompatible uses adjacent to it, and placement of barriers in the movement path.
- F. The project does not maintain adequate visual continuity (i.e., long lines-of-site) within wildlife corridors or linkage.

6.2 ANALYSIS OF PROJECT EFFECTS

The proposed project would not result in significant impacts under the above guidelines for the following reasons:

- 6.1.A Although the proposed project would directly impact habitat for several animal species, land to the south and west of the site is largely developed and as such the project would be constructed on the edge of existing development, thus not preventing wildlife access to areas necessary for their survival. As such, no significant impact would occur under County Guideline 6.1.A.
- 6.1.B The area surrounding the project site is largely developed to the south and west and the site therefore does not act as a linkage between blocks of habitat. Thus, implementation of the project would not interfere with wildlife movement along a local or regional corridor. As such, no significant impact would occur under County Guideline 6.1.B.

- 6.1.C The project would not create artificial wildlife corridors. Under County Guideline 6.1.C, no significant impact would occur.
- 6.1.D As previously discussed in Section 3.2, all proposed project-related lighting would be required to adhere to Division 9 of the San Diego County Light Pollution Code. Lighting within the proposed project site adjacent to undeveloped habitat would be of the lowest illumination allowed for human safety, selectively placed, shielded, and directed away from such habitat. Additionally, the site is not part of a regional corridor or linkage. Under County Guideline 6.1.D, no significant impact to the wildlife corridor resulting from lighting would occur.
- 6.1.E The project would not reduce an existing wildlife corridor or linkage, or further constrain an already narrow wildlife corridor. As discussed in Section 1.4.8, the project site is not part of a local or regional wildlife corridor or linkage. Under County Guideline 6.1.E, no significant impact would occur.
- 6.1.F The project would not affect visual continuity within wildlife corridors or linkages, as none exist on site. Under County Guideline 6.1.F, no significant impact would occur.

6.3 CUMULATIVE IMPACT ANALYSIS

No significant impacts would occur and no mitigation is required.

6.4 MITIGATION MEASURES AND DESIGN CONSIDERATIONS

No significant impacts would occur and no mitigation is required.

6.5 CONCLUSION

No significant impacts would occur and no mitigation is required.

7.0 LOCAL POLICIES, ORDINANCES, AND ADOPTED PLANS

7.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? Would the project conflict with the provisions of an adopted Habitat Conservation Plan (HCP), NCCP plan, or other approved local, regional or state habitat conservation plan (County 2009b)?

Any of the following conditions would be considered significant if:

- A. For lands outside of the MSCP, the project would impact Diegan coastal sage scrub vegetation in excess of the County's 5 percent habitat loss threshold as defined by the Southern California Coastal Sage Scrub NCCP Guidelines.

- B. The project would preclude or prevent the preparation of the subregional NCCP. For example, the project proposes development within areas that have been identified by the County or resource agencies as critical to future habitat preserves.
- C. The project will impact any amount of wetlands or sensitive habitat lands as outlined in the RPO.
- D. The project would not minimize and/or mitigate coastal sage scrub habitat loss in accordance with Section 4.3 of the NCCP Guidelines.
- E. The project does not conform to goals and requirements outlined in any applicable Habitat Conservation Plan, RMP, Special Area Management Plan, Watershed Plan, or similar regional planning effort.
- F. For lands within the MSCP, the project would not minimize impacts to BRCA, as defined in the BMO.
- G. The project would preclude connectivity between areas of high habitat values, as defined by the Southern California Coastal Sage Scrub NCCP Guidelines.
- H. The project does not maintain existing movement corridors and/or habitat linkages as defined by the BMO.
- I. The project does not avoid impacts to MSCP narrow endemic species and would impact core populations of narrow endemics.
- J. The project would reduce the likelihood of survival and recovery of listed species in the wild.
- K. The project would result in the killing of migratory birds or destruction of active migratory bird nests and/or eggs (MBTA).
- L. The project would result in the take of eagles, eagle eggs or any part of an eagle (BGEPA).

7.2 ANALYSIS OF PROJECT EFFECTS

The proposed project would result in significant impacts under the above guidelines for the following reason:

- 7.1.C The proposed project would directly impact a total of 83.2 acres of sensitive habitat lands as outlined in the RPO. This would be a significant impact according to County Guideline 7.1.C.
- 7.1.F The proposed project would not minimize impacts to lands that qualify as a BRCA. This would be a significant impact under County Guideline 7.1.F.

- 7.1.I The proposed project would impact 3 MSCP narrow endemic animal species: San Diego and Riverside fairy shrimp, and burrowing owl.
- 7.1.K Implementation of the proposed project could potentially result in the killing of migratory birds or destruction of active migratory bird nests and/or eggs (MBTA). This would be significant according to County Guideline 7.1.K.

The proposed project would not result in significant impacts under the above guidelines for the following reasons:

- 7.1.A The project is within the MSCP Subarea Plan. Therefore, County Guideline 7.1.A is not applicable.
- 7.1.B Implementation of the proposed project would not preclude or prevent the preparation of the subregional NCCP as the project site occurs within a subregion with an approved NCCP Plan (MSCP) and is not identified as an area critical to future habitat preserves. Under County Guideline 7.1.B, no significant impact would occur.
- 7.1.D The project would not impact coastal sage scrub, thus no significant impact would occur under County Guideline 7.1.D.
- 7.1.E The project site is within a Minor Amendment Area in the County's MSCP Subarea. The project provides mitigation consistent with the BMO and otherwise conforms to the goals and requirements outlined in the Subarea Plan. Under County Guideline 7.1.E, no significant impact would occur.
- 7.1.G The project would not preclude connectivity between areas of high habitat values, as lands on and adjacent to the project site are identified as Low or Medium quality habitat, or as Agriculture, on the County's Habitat Evaluation Map. As such, no significant impact would occur under County Guideline 7.1.G.
- 7.1.H As discussed in Section 1.4.8, the project site is not part of a local or regional wildlife corridor or linkage. Under County Guideline 7.1.H, no significant impact would occur.
- 7.1.J Locations of 2 listed species (San Diego and Riverside fairy shrimp) would be impacted upon project implementation. These impacts, however, would not reduce the likelihood of survival and recovery of these species in the wild.
- 7.1.L Implementation of the proposed project would not result in the take of eagles, eagle eggs, or any part of an eagle. Under County Guideline 7.1.L, no significant impact would occur.

7.3 CUMULATIVE IMPACT ANALYSIS

Each of the cumulative projects listed in Table 6 and discussed above would be required to conform to County Guidelines 7.1.A through 7.1.L and provide mitigation as appropriate. In addition, the proposed project results in less than significant impacts for 8 of the 12 guidelines in Section 7.0. Mitigation is proposed to reduce the project impacts to sensitive habitats (as defined by the County RPO) and animal species to below a level of significance for County Guidelines 7.1.C, 7.1.F, 7.1.I, and 7.1.K.

7.4 MITIGATION MEASURES AND DESIGN CONSIDERATIONS

Impact 7.4.1 Mitigation is required for impacts to lands identified as sensitive in the RPO.

MM 7.4.1 Mitigation for impacts to sensitive habitats as identified in the RPO will occur through implementation of MM 4.4.1a through 4.4.1c.

Impact 7.4.2a-b

The proposed project would impact 3 MSCP narrow endemic animal species: San Diego fairy shrimp, Riverside fairy shrimp, and burrowing owl.

MM 7.4.2a Implementation of MM 3.4.1 would mitigate for impacts to fairy shrimp.

MM 7.4.2b Implementation of MM 3.4.2 and 3.4.3b would mitigate for impacts to burrowing owl.

Impact 7.4.3 Breeding birds may temporarily or permanently leave their territories to avoid construction and/or extraction operations, which could lead to reduced reproductive success and increased mortality.

Impact 7.4.4 The proposed project would not minimize impacts to lands that qualify as a BRCA. This would be a significant impact under County Guideline 7.1.F.

MM 7.4.4 Impacts to lands qualifying as a BRCA would be mitigated through implementation of MM 4.4.1a through 4.4.1c as well as MM 3.4.1 and MM 3.4.2.

MM 7.4.3 In order to ensure compliance with the MBTA, clearing of native vegetation will occur outside of the breeding season of most avian species (February 1 through September 1). Clearing during the breeding season of MBTA-covered species could occur if it is determined that no nesting birds (or birds displaying breeding or nesting behavior) are present immediately prior to clearing. A pre-construction survey will be conducted 3 days prior to clearing or grading activities to determine if breeding or nesting avian species occur within impact areas prior to project implementation.

7.5 CONCLUSION

Implementation of the proposed project would result in a significant impact to sensitive lands as outlined in the RPO, County narrow endemic animal species, and potentially to breeding birds. Off-site acquisition of habitat, restoration and/or preservation of vernal pool habitat, species translocation (as appropriate), as well as avoiding the bird breeding season would reduce these impacts to below a level of significance.

8.0 SUMMARY OF PROJECT IMPACTS AND MITIGATION

Implementation of the proposed project would result in significant impacts to special status animal species, natural communities, and local policies.

Implementation of the proposed project would result in direct impacts to the following special status species: small-flowered morning glory, San Diego fairy shrimp, Riverside fairy shrimp, western spadefoot, burrowing owl, northern harrier, grasshopper sparrow, California horned lark, turkey vulture, and San Diego black-tailed jackrabbit. In addition, project implementation would impact potential foraging and/or nesting habitat of loggerhead shrike as well as golden eagle foraging habitat.

Implementation of the proposed project would result in impacts to the following sensitive vegetation communities: road pool with San Diego and/or Riverside fairy shrimp, southern willow scrub, and non-native grassland. In addition, impacts to Corps jurisdictional areas would result from the project implementation.

Mitigation for impacts to small-flowered morning glory would be through off-site preservation of habitat. Mitigation for impacts to sensitive animal species would occur through a combination of translocation and off-site restoration and preservation of habitat. Impacts to sensitive vegetation communities would be mitigated by off-site preservation of habitat. Long-term habitat management would be provided for all off-site preservation areas.

With implementation of the mitigation measures listed in Sections 3.4, 4.4, 5.4, 6.4, and 7.4 for significant impacts to sensitive biological resources, all project-specific impacts would be mitigated to below a level of significance. Table 9 provides a summary of the proposed mitigation measures.

Table 8
IMPACTS AND MITIGATION FOR HABITAT/VEGETATION COMMUNITIES (acre[s])¹

VEGETATION COMMUNITY/HABITAT ²	TIER	ACREAGE			MITIGATION				
		Existing	Impacts	Off Site Impacts	Mitigation Ratio	Required	Preserved On Site	Impact Neutral	Off Site Mitigation
Road pool with fairy shrimp (no code)	IV	0.06	0.06	0	5:1	0.30 ³	0	0	0.30
Southern willow scrub (63320)	I	0.08	0.08	0	1:1	0.08	0	0	0.08
Non-native grassland (42200)	III	74.0	73.9	9.2	1:1 ⁴	83.1	0	0	83.1 ⁵
Disturbed habitat (11300)	IV	3.0	2.9	1.6	--	0	0	0	0.0
Developed land (12000)	IV	2.1	2.1	1.9	--	0	0	0	0.0
TOTAL		79.3	79.0	12.7	--	83.5	0	0	83.5

¹Upland habitats are rounded to the nearest 0.1 acre, while wetland habitats are rounded to the nearest 0.01; thus, totals reflect rounding

²Vegetation categories and numerical codes are from Holland (1986) and Oberbauer (2008)

³ Assumes mitigation for impacts to 0.06 acre of on site road pools with fairy shrimp, totaling 0.30 acre, will be conducted by the OBP project under their take authorization, which is expected to be issued prior to approval of the proposed project.

⁴ Mitigation for impacts to non-native grassland would be required at a 1:1 ratio because the project site is occupied by burrowing owl.

⁵ Mitigation for areas of grassland impact overlap with OBP would be mitigated by OBP. The portion of grassland mitigation to be mitigated by OBP is 17.2 acres, and the remaining 65.9 acres would be mitigated by the Hawano project, for a total of 83.1 acres of grassland mitigation (1:1 ratio).

Table 9
SUMMARY OF MITIGATION MEASURES

Proposed Mitigation	Level of Significance After Mitigation	Guideline Number(s)
<p><i>MM 3.4.1</i> Mitigation for impacts to 0.06 acre of habitat supporting the federally endangered San Diego fairy shrimp and federally endangered Riverside fairy shrimp will occur at a 5:1 ratio through off-site restoration and/or preservation of 0.30 acre of vernal pool habitat, including translocation of soil inoculum. The impacted pools are within the off-site impact area for the adjacent Otay Business Park project (OBP; TM 5505), and are anticipated to receive take authorization through the OBP project and mitigated according to the conditions set forth in the Biological Opinion (BO) to be issued for the OBP project. A Section 7 Consultation has been initiated for these impacts and a Vernal Pool Restoration Plan has been prepared for the OBP project (HELIX 2011b) and submitted to the County and resource agencies for review and approval. Should the OBP project not move forward ahead of the proposed project, the proposed project would mitigate for the 0.06 acre of onsite road pools according to the conditions set forth in the BO for OBP. The proposed project will be conditioned to complete its portion of all required mitigation for impacts to fairy shrimp pursuant to the Vernal Pool Preserve Restoration Plan (Appendix H [HELIX 2011b]) or to provide evidence that mitigation totaling 0.30 acre of vernal pools has been completed through a combination of off-site restoration and/or preservation in accordance with the restoration plan. The proposed project also will be conditioned to either obtain take authorization for impacts to fairy shrimp or demonstrate that take authorization has already been issued for these impacts.</p>	Less than significant	<p>3.1.A 4.1.A 5.1.A 7.1.C 7.1.I</p>

Table 9 (cont.)
SUMMARY OF MITIGATION MEASURES

Proposed Mitigation	Level of Significance After Mitigation	Guideline Number(s)
<i>MM 3.4.2</i> Mitigation for impacts to raptor foraging habitat will occur at a 1:1 ratio through off-site preservation of grassland habitat in accordance with the County's owl strategy and mitigation measure 4.4.1c.	Less than significant	3.1.B 3.1.E 3.1.F 4.1.A
<i>MM 3.4.3a</i> No grubbing, clearing, or grading within 300 feet of an active raptor nest during the raptor-breeding season (February 1 to July 15) will occur. As such, all grading permits, improvement plans, and the final map will state the same. If grubbing, clearing, or grading would occur during the raptor-breeding season, a pre-grading survey will be conducted within 3 days prior to grading to determine if raptors occur within the areas directly impacted by grading or indirectly impacted by noise. If there are no raptors nesting (includes nest building or other breeding/nesting behavior) within this area, development will be allowed to proceed. However, if raptors are observed nesting or displaying breeding/nesting behavior within the area, construction will be postponed until (1) all nesting (or breeding/nesting behavior) has ceased or until after July 15; or (2) a temporary noise barrier or berm will be constructed at the edge of the development footprint to reduce noise levels below 60 dB L _{eq} or ambient (if ambient is greater than 60 dB L _{eq}). Alternatively, the duration of construction equipment operation could be controlled to keep noise levels below 60 dB L _{eq} or ambient in lieu of or in concert with a wall or other sound attenuation barrier.	Less than significant	3.1.G 7.1.K

Table 9 (cont.)
SUMMARY OF MITIGATION MEASURES

Proposed Mitigation	Level of Significance After Mitigation	Guideline Number(s)
<i>MM 3.4.3b</i> No grading may occur within occupied burrowing owl habitat during the burrowing owl breeding season (February 1 through August 31). Outside the breeding season, a pre-construction survey to identify the known active burrows would be conducted no more than seven days prior to initiation of construction. Weed removal (by whacking, bush hogging, or mowing) would be conducted, under the guidance of a qualified biological monitor, to make all potential burrows more visible to avoid injuring owls by burrow collapse. If owls were present in the burrows, a qualified biologist would implement passive relocation measures (installation of one-way doors) in accordance with CDFG regulations (CDFG 1995). Once all owls have vacated the burrows (approximately 48 hours), a qualified biologist would oversee the excavation and filling of the burrows.	Less than significant	3.1.G 7.1.I 7.1.K
<i>MM 3.4.4</i> Impacts to small-flowered morning glory would be mitigated through preservation of off-site grassland habitat suitable for supporting this species. The preserved habitat will be part of the area to be preserved as mitigation for impacts to non-native grassland (MM 4.4.1c) and raptor foraging habitat (MM 3.4.2).	Less than significant	3.1.C
<i>MM 4.4.1a</i> Implementation of MM 3.4.1 would mitigate for impacts to road pools with fairy shrimp.	Less than significant	4.1.A
<i>MM 4.4.1b</i> Mitigation for impacts to 0.08 acre of non-jurisdictional southern willow scrub will occur at a 1:1 ratio through purchase of credits at the Rancho Jamul Wetland Mitigation Bank.	Less than significant	4.1.A 7.1.C

Table 9 (cont.)
SUMMARY OF MITIGATION MEASURES

Proposed Mitigation	Level of Significance After Mitigation	Guideline Number(s)
<p><i>MM 4.4.1c</i> Impacts to non-native grassland will be mitigated at a 1:1 ratio in accordance with the County's burrowing owl strategy (County 2010). The mitigation will consist of 83.1 acres of non-native grassland habitat preserved off site. Per the County's strategy, this may occur through a combination of on- and off-mesa preservation. An RMP for the off-site burrowing owl occupied non-native grassland habitat mitigation also will be prepared and submitted for County and Wildlife Agency review once the location of this mitigation is identified.</p> <p>A total of 17.2 acres of the proposed project's non-native grassland impacts overlap with the OBP project impacts. If OBP is implemented first the proposed project would not impact this habitat and the corresponding mitigation requirement would be reduced accordingly. If the Hawano project is implemented ahead of OBP, then Hawano may use 17.2 acres of non-native grassland habitat at the Lonestar site as partial mitigation. The remaining 65.9 acres would be mitigated by the proposed project per the County's strategy. An RMP for mitigation occurring at Lonestar Ridge has been prepared as part of the OBP project (Appendix I [HELIX 2011c]) and is anticipated to be carried out by the OBP project. If the Hawano project uses a portion of Lonestar for its non-native grassland mitigation needs then it also will implement its respective portion of the Lonestar Ridge RMP. Other management requirements in the RMP not directly associated with the preservation of 17.2 acres of non-native grassland would not be implemented.</p>	Less than significant	4.1.A 7.1.C
<p><i>MM 4.4.2a</i> Impacts to Corps jurisdictional areas (i.e., road pools with fairy shrimp) will be mitigated at a 3:1 ratio and total 0.18 acre as described in MM 4.4.1a.</p>	Less than significant	4.1.B 5.1.A

Table 9 (cont.)
SUMMARY OF MITIGATION MEASURES

Proposed Mitigation	Level of Significance After Mitigation	Guideline Number(s)
<i>MM 7.4.1</i> Mitigation for impacts to sensitive habitats as identified in the RPO will occur through implementation of MM 4.4.1a through 4.4.1c.	Less than significant	7.1.C
<i>MM 7.4.2a</i> Implementation of MM 3.4.1 would mitigate for impacts to fairy shrimp.	Less than significant	7.1.I
<i>MM 7.4.2b</i> Implementation of MM 3.4.2 and 3.4.3b would mitigate for impacts to burrowing owl.	Less than significant	7.1.I
<i>MM 7.4.3</i> In order to ensure compliance with the MBTA, clearing of native vegetation will occur outside of the breeding season of most avian species (February 1 through September 1). Clearing during the breeding season of MBTA-covered species could occur if it is determined that no nesting birds (or birds displaying breeding or nesting behavior) are present immediately prior to clearing. A pre-construction survey will be conducted 3 days prior to clearing or grading activities to determine if breeding or nesting avian species occur within impact areas prior to project implementation.	Less than significant	7.1.K
<i>MM 7.4.4</i> Implementation of MM 4.4.1a through 4.4.1c and MM 3.4.1 and MM 3.4.2 would mitigate for impacts to lands qualifying as a BRCA.	Less than significant	7.1.F

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Appendix A

PLANT SPECIES OBSERVED



Appendix A
PLANT SPECIES OBSERVED – HAWANO

<u>FAMILY</u>	<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>HABITAT</u>[‡]
ANGIOSPERMS – MONOCOTS			
Arecaceae	<i>Washingtonia robusta</i> *	Mexican fan palm	SWS
Cyperaceae	<i>Cyperus eragrostis</i>	tall flatsedge	SWS
Poaceae	<i>Achnatherum coronatum</i>	giant stipa	NNG
	<i>Avena barbata</i> *	slender wild oat	NNG
	<i>Avena fatua</i> *	wild oat	NNG
	<i>Bromus diandrus</i> *	common ripgut grass	NNG, SWS
	<i>Bromus madritensis</i> ssp. <i>rubens</i> *	foxtail chess	NNG
	<i>Distichlis spicata</i>	saltgrass	NNG
	<i>Hordeum murinum</i> *	barley	NNG
	<i>Lolium multiflorum</i> *	Italian ryegrass	NNG
	<i>Paspalum</i> sp.*	knotgrass	SWS
	<i>Phalaris</i> sp.*	canary grass	SWS
	<i>Polypogon monspeliensis</i> *	annual beard grass	NNG, SWS
Typhaceae	<i>Typha</i> sp.	cattail	SWS
ANGIOSPERMS – DICOTS			
Anacardiaceae	<i>Schinus terebinthifolius</i> *	Brazilian pepper tree	SWS
Apiaceae	<i>Foeniculum vulgare</i> *	fennel	NNG
Asteraceae	<i>Anthemis cotula</i> *	mayweed	NNG
	<i>Baccharis salicifolia</i>	mule fat	NNG
	<i>Baccharis sarothroides</i>	broom baccharis	NNG
	<i>Carduus pycnocephalus</i> *	Italian thistle	NNG, SWS
	<i>Centaurea melitensis</i> *	star thistle	NNG
	<i>Conyza canadensis</i>	horseweed	NNG
	<i>Cynara cardunculus</i> *	cardoon	NNG
	<i>Deinandra fasciculata</i>	fascicled tarplant	NNG
	<i>Filago gallica</i> *	narrow-leaf filago	NNG
	<i>Helianthus annuus</i>	western sunflower	NNG
	<i>Heterotheca grandiflora</i>	telegraph weed	NNG
	<i>Hypochaeris glabra</i> *	smooth cat's-ear	NNG
	<i>Isocoma menziesii</i> var. <i>menziesii</i>	spreading goldenbush	NNG
	<i>Lactuca serriola</i> *	prickly-lettuce	NNG, SWS
	<i>Picris echioides</i> *	bristly ox-tongue	NNG, SWS
	<i>Sonchus asper</i> *	prickly sow thistle	NNG
	<i>Sonchus oleraceus</i> *	common sow thistle	NNG, SWS

Appendix A (cont.)
PLANT SPECIES OBSERVED – HAWANO

<u>FAMILY</u>	<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>HABITAT</u>[‡]
ANGIOSPERMS – DICOTS (cont.)			
Asteraceae (cont.)	<i>Taraxacum officinale</i> *	dandelion	NNG, SWS
	<i>Tragopogon</i> sp.*	salsify	NNG
Boraginaceae	<i>Amsinckia menziesii</i> var. <i>intermedia</i>	rancher's fiddleneck	NNG
	<i>Plagiobothrys</i> sp.	popcornflower	NNG
	<i>Brassica nigra</i> *	black mustard	NNG
Brassicaceae	<i>Lepidium nitidum</i>	shining peppergrass	NNG
	<i>Raphanus sativus</i> *	wild radish	NNG
	<i>Silene gallica</i> *	common catchfly	NNG
Caryophyllaceae	<i>Atriplex semibaccata</i> *	Australian saltbush	NNG
Chenopodiaceae	<i>Salsola tragus</i> *	Russian thistle	DH, NNG
	<i>Calystegia macrostegia</i>	morning-glory	NNG
Convolvulaceae	<i>Convolvulus arvensis</i> *	field bindweed	NNG
	<i>Convolvulus simulans</i> †	small-flowered morning glory	NNG
Crassulaceae	<i>Crassula connata</i>	pygmyweed	NNG
Euphorbiaceae	<i>Chamaesyce polycarpa</i>	small-seed sandmat	DH, NNG
	<i>Croton setigerus</i>	doveweed	DH, NNG
Fabaceae	<i>Lotus</i> sp.	lotus	NNG
	<i>Lupinus bicolor</i>	miniature lupine	NNG
	<i>Medicago polymorpha</i> *	California burclover	NNG
	<i>Melilotus alba</i> *	white sweet clover	NNG, SWS
	<i>Melilotus indica</i> *	Indian sweet clover	NNG
	<i>Trifolium</i> sp.*	clover	NNG
	<i>Vicia sativa</i> *	vetch	NNG
Geraniaceae	<i>Erodium botrys</i> *	long-beak filaree	NNG
	<i>Erodium cicutarium</i> *	red-stem filaree	DH, NNG
	<i>Erodium moschatum</i> *	white-stem filaree	NNG
Malvaceae	<i>Malva parviflora</i> *	cheeseweed	DH, NNG
	<i>Malvella leprosa</i>	alkali-mallow	NNG
Onagraceae	<i>Gaura</i> sp.*	gaura	NNG
Polygonaceae	<i>Eriogonum fasciculatum</i>	California buckwheat	NNG
	<i>Polygonum arenastrum</i> *	common knotweed	NNG
	<i>Rumex crispus</i> *	curly dock	NNG
Primulaceae	<i>Anagallis arvensis</i> *	scarlet pimpernel	NNG

Appendix A (cont.)
PLANT SPECIES OBSERVED – HAWANO

<u>FAMILY</u>	<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>HABITAT</u>[‡]
ANGIOSPERMS – DICOTS (cont.)			
Salicaceae	<i>Salix gooddingii</i>	black willow	SWS
	<i>Salix lasiolepis</i>	arroyo willow	SWS
Solanaceae	<i>Nicotiana glauca</i> *	Tree tobacco	NNG
Tamaricaceae	<i>Tamarix ramosissima</i> *	tamarisk	SWS

[‡]Habitat acronyms: DH=disturbed habitat, NNG=non-native grassland, SWS=southern willow scrub

*Non-native species.

[†]Sensitive species

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Appendix B

ANIMAL SPECIES OBSERVED



Appendix B
ANIMAL SPECIES OBSERVED – HAWANO

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
INVERTEBRATES	
<i>Brephidium exilis</i>	western pygmy-blue butterfly
<i>Colias eurytheme</i>	orange sulphur butterfly
<i>Erynnis funeralis</i>	funereal duskywing
<i>Papilio zelicaon</i>	anise swallowtail
<i>Pepsis</i> sp.	tarantula hawk
<i>Pieris rapae</i> *	cabbage white butterfly
<i>Pontia protodice</i>	checkered white butterfly
<i>Pyrgus albescens</i>	western checkered skipper
<i>Vanessa cardui</i>	painted lady
<i>Vannessa annabella</i>	west coast lady
<i>Branchinecta sandiegonensis</i> †	San Diego fairy shrimp
<i>Streptocephalus woottoni</i> †	Riverside fairy shrimp
VERTEBRATES	
<u>Amphibian</u>	
<i>Spea hammondi</i> †	western spadefoot toad
<u>Reptiles</u>	
<i>Elgaria multicarinata</i>	southern alligator lizard
<i>Sceloporus occidentalis</i>	western fence lizard
<i>Uta stansburiana</i>	common side-blotched lizard
<u>Birds</u>	
<i>Ammodramus savannarum</i> †	grasshopper sparrow
<i>Agelaius phoeniceus</i>	red-winged black bird
<i>Athene cunicularia</i> †	burrowing owl
<i>Buteo jamaicensis</i>	red-tailed hawk
<i>Calypte anna</i>	Anna's hummingbird
<i>Carpodacus mexicanus</i>	house finch
<i>Cathartes aura</i> †	turkey vulture
<i>Circus cyaneus</i> †	northern harrier
<i>Columba livia</i> *	rock dove
<i>Corvus brachyrhynchos</i>	American crow

Appendix B (cont.)
ANIMAL SPECIES OBSERVED – HAWANO

SCIENTIFIC NAME

COMMON NAME

VERTEBRATES (cont.)

Birds (cont.)

<i>Corvus corax</i>	common raven
<i>Eremophila alpestris actia</i> †	California horned lark
<i>Falco sparverius</i>	American kestrel
<i>Lanius ludovicianus</i> †	loggerhead shrike
<i>Mimus polyglottus</i>	northern mockingbird
<i>Passerculus sandwichensis</i>	savanna sparrow
<i>Petrochelidon pyrrhonota</i>	cliff swallow
<i>Sayornis saya</i>	Say's phoebe
<i>Sturnella neglecta</i>	western meadowlark
<i>Sturnus vulgaris</i> *	European starling
<i>Tyrannus vociferans</i>	Cassin's kingbird
<i>Zenaida macroura</i>	mourning dove
<i>Zonotrichia leucophrys</i>	white-crowned sparrow

Mammals

<i>Canis latrans</i>	coyote
<i>Lepus californicus bennettii</i> †	San Diego black-tailed jack rabbit
<i>Spermophilus beecheyi</i>	California ground squirrel
<i>Sylvilagus bachmani</i>	brush rabbit
<i>Thomomys bottae</i>	Botta's pocket gopher

*Non-native species

†Sensitive species



Appendix C

SENSITIVE PLANT SPECIES OBSERVED OR WITH POTENTIAL TO OCCUR



Appendix C
SENSITIVE PLANT SPECIES OBSERVED
OR WITH POTENTIAL TO OCCUR – HAWANO

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
San Diego thorn-mint (<i>Acanthomintha ilicifolia</i>)	FT/SE CNPS List 1B.1 County Group A	Low. Occurs on friable clay soils, often in open areas within grasslands. Although suitable habitat occurs on site, would likely have been observed during vernal pool surveys or rare plant surveys if present.
San Diego needlegrass (<i>Achnatherum diegoensis</i>)	--/-- CNPS List 4.2 County Group D	Low. Chaparral and sage scrub ecotone is preferred. The species is closely associated with metavolcanic soils and can be found in fine sandy loam and rocky silt loams. Peaks and upper ridgelines of mountains appear the preferred microhabitat. Habitat on site is not typical for this species.
San Diego adolphia (<i>Adolphia californica</i>)	--/-- CNPS List 2.1 County Group B	Low. Most often found in sage scrub but occasionally occurs in peripheral chaparral habitats, particularly hillsides near creeks. Usually associated with xeric locales where shrub canopy reaches 4 or 5 feet. Suitable habitat does not occur on site.
Shaw's agave (<i>Agave shawii</i>)	--/-- CNPS List 2.1 County Group B	Low. Occurs in coastal sage scrub and coastal bluff scrub. Suitable habitat does not occur on site.
San Diego ambrosia (<i>Ambrosia pumila</i>)	FE/-- CNPS List 1B.1 County Group A	Low. Generally found along creeks or seasonal drainages along the periphery of willow riparian areas. Suitable habitat does not occur on site.
Golden-spined cereus (<i>Bergerocactus emoryi</i>)	--/-- CNPS List 2.2 County Group B	Very low. Generally found in maritime succulent scrub, which does not occur on site.
Orcutt's brodiaea (<i>Brodiaea orcuttii</i>)	--/-- CNPS List 1B.1 County Group A	Low. Occurs in vernal pool communities and ephemeral streams and seeps in Riverside and San Bernardino counties south to Baja. Would likely have been observed during vernal pool surveys or rare plant surveys if present.
Dunn's mariposa lily (<i>Calochortus dunnii</i>)	--/SR CNPS List 1B.2 County Group A	Low. Typically occurs in chaparral growing on metavolcanic or gabbro soils. The site is below elevation range of this species and lacks appropriate habitat.
Wart-stemmed ceanothus (<i>Ceanothus verrucosus</i>)	--/-- CNPS List 2.2 County Group B	Very low. Occurs in coastal and maritime chaparral communities. Suitable conditions do not occur on site.

Appendix C (cont.)
SENSITIVE PLANT SPECIES OBSERVED
OR WITH POTENTIAL TO OCCUR – HAWANO

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
Summer holly (<i>Comarostaphylis diversifolia</i> ssp. <i>diversifolia</i>)	--/-- CNPS List 1B.2 County Group A	None. A conspicuous shrub occurring in chaparral, which does not occur on site. Would have been observed if present.
Small-flowered morning-glory (<i>Convolvulus simulans</i>)	--/-- CNPS List 4.2 County Group D	Observed in a scattered distribution throughout the site. Habitat is friable clay soils in open areas within coastal sage scrub, chaparral, or grasslands.
Orcutt's bird's-beak (<i>Cordylanthus orcuttianus</i>)	--/-- CNPS List 2.1 MSCP Covered County Group B	Low. Annual species occurring in seasonal drainages and scrub communities adjacent to riparian areas. Suitable habitat does not occur on site.
Tecate cypress (<i>Cupressus forbesii</i>)	--/-- CNPS List 1B.1 County Group A	None. Evergreen tree occurring in southern mixed chaparral and cypress forest. Suitable habitat does not occur on site. Would have been observed if present.
Otay tarplant (<i>Deinandra conjugens</i>)	FT/SE CNPS List 1B.1 County Group A	Low. Occurs on friable clay soils in grasslands or very open coastal sage scrub. Although grasslands and clay soils occur on site, this species was not detected during rare plant surveys.
Western dichondra (<i>Dichondra occidentalis</i>)	--/-- CNPS List 4.2 County Group D	Very low. Found in chaparral, coastal sage scrub, and among rocky outcrops in grasslands. Suitable habitat does not occur on site.
Orcutt's dudleya (<i>Dudleya attenuata</i> ssp. <i>orcuttii</i>)	--/-- CNPS List 2.1 County Group B	Low. Found in coastal sage scrub openings, typically in coastal situations. Suitable habitat does not occur on site.
Variegated dudleya (<i>Dudleya variegata</i>)	--/-- CNPS List 1B.2 County Group A	Low. Grows on rocky clay soils in grasslands, sage scrub, and chaparral. Although grasslands and clay soils occur on site, this species was not detected during rare plant surveys.
Palmer's goldenbush (<i>Ericameria palmeri</i> ssp. <i>palmeri</i>)	--/-- CNPS List 2.2 County Group B	Very low. Typically occurs in chaparral and along coastal drainages. Species is a large shrub that would likely have been detected if present on site.
San Diego button-celery (<i>Eryngium aristulatum</i> ssp. <i>parishii</i>)	FE/SE CNPS List 1B.1 County Group A	Low. Typical habitat is on the periphery of vernal pools and in areas with mima mound topography. Would have been observed during vernal pool surveys or rare plant surveys if present.
San Diego barrel cactus (<i>Ferocactus viridescens</i>)	--/-- CNPS List 2.1	Low. Generally found on Diegan coastal sage scrub hillsides, often at the crest of slopes

Appendix C (cont.)
SENSITIVE PLANT SPECIES OBSERVED
OR WITH POTENTIAL TO OCCUR – HAWANO

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
	County Group B	among cobbles; occasionally found on the periphery of vernal pools and mima mounds. Suitable habitat does not occur on site.
Chocolate lily (<i>Fritillaria biflora</i>)	--/-- not CNPS listed County Group D	Low to moderate. Typically found in native or non-native grasslands, as well as openings within sage scrub and chaparral, or native perennial grasslands, often in areas with clay soils. Although suitable habitat occurs on site, this species was not observed during rare plant surveys.
Palmer's grapplinghook (<i>Harpagonella palmeri</i>)	--/-- CNPS List 4.2 County Group B	Low to moderate. Occurs on grassy slopes and open coastal sage scrub with clay soil. Although suitable habitat occurs on site, this species was not observed during rare plant surveys.
Graceful tarplant (<i>Holocarpha virgata</i> ssp. <i>elongata</i>)	--/-- CNPS List 4.2 County Group D	Moderate. Generally found in grasslands and very open scrublands. Reported to occur in scattered locations in O'Neal Canyon. Potentially suitable habitat occurs on site but this species was not observed during surveys.
San Diego marsh-elder (<i>Iva hayesiana</i>)	--/-- CNPS List 2.2 County Group B	Low. Typical habitat includes intermittent streambeds with open riparian canopy, allowing substantial sunlight to penetrate; often found on sandy alluvial embankments with cobbles. Suitable habitat does not occur on site.
Heart-leaved pitcher sage (<i>Lepechinia cardiophylla</i>)	--/-- CNPS List 1B.2 County Group A	Very low. Occurs in thick chaparral and known in California from only 10 sites. Would have been observed if present.
Gander's pitcher sage (<i>Lepechinia ganderi</i>)	--/-- CNPS List 1B.3 MSCP NE County Group A	Very low. Occurs on metavolcanic soils in chaparral. Suitable conditions do not occur on site.
Robinson's peppergrass (<i>Lepidium virginicum</i> var. <i>robinsonii</i>)	--/-- CNPS List 1B.2 County Group A	Low. This annual herb grows in openings in chaparral and sage scrub at the coastal and foothill elevations. Typically observed in relatively dry, exposed locales rather than beneath a shrub canopy or along creeks. Suitable habitat does not occur on site.
Willow monardella (<i>Monardella linoides</i> ssp.)	FE/SE CNPS 1B.1	Very low. Typically occurs in riparian scrub, and sometimes chaparral or coastal sage scrub

Appendix C (cont.)
SENSITIVE PLANT SPECIES OBSERVED
OR WITH POTENTIAL TO OCCUR – HAWANO

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
<i>viminea</i>)	County Group A	associated with drainages. Would likely have been observed if present.
San Diego goldenstar (<i>Muilla clevelandii</i>)	--/-- CNPS List 1B.1 County Group A	Low to moderate. Generally grows on clay soils in grasslands, often in association with mima mounds and vernal pools. Marginally suitable habitat occurs on site.
Little mousetail (<i>Myosurus minimus</i> ssp. <i>apus</i>)	--/-- CNPS List 3.1 County Group A	Low. Occurs in vernal pool communities, typically in deeper areas. The road pools on site do not provide suitable habitat for this species.
Spreading navarretia (<i>Navarretia fossalis</i>)	FT/-- CNPS List 1B.1 County Group A	Low. Habitat includes vernal pools, vernal swales, or roadside depressions. Depth of pool appears to be a significant factor as this species is rarely found in shallow pools. Although marginally suitable habitat occurs on site, this species would likely have been observed during vernal pool surveys or rare plant surveys if present.
Dehesa bear grass (<i>Nolina interrata</i>)	--/SE CNPS List 1B.1 County Group A	Very low. Occurs in mafic chaparral such, often with gabbroic soils. Suitable habitat does not occur on site.
Snake cholla (<i>Opuntia californica</i> var. <i>californica</i>)	--/-- CNPS List 1B.1 County Group A	Very low. Chaparral and coastal sage scrub from Point Loma south to Chula Vista and Baja. Although historically reported on Otay Mesa, not known from the project vicinity. Suitable habitat does not occur on site.
California Orcutt grass (<i>Orcuttia californica</i>)	FE/SE CNPS List 1B.1 County Group A	Low. Occurs in vernal pool communities. Would likely have been observed during vernal pool or rare plant surveys if present.
Short-lobed broomrape (<i>Orobanche parishii</i> ssp. <i>brachyloba</i>)	--/-- CNPS List 4.2 County Group A	None. Occurs on sandy substrates in coastal bluff scrub and coastal dunes. Appropriate habitat does not occur on site.
Otay Mesa mint (<i>Pogogyne nudiuscula</i>)	FE/SE CNPS List 1B.1 County Group A	Low. Occurs in Otay Mesa vernal pool communities. Would likely have been observed during vernal pool or rare plant surveys if present.
Nuttall's scrub oak (<i>Quercus dumosa</i>)	--/-- CNPS List 1B.1 County Group A	Very low. A conspicuous shrub occurring in chaparral and coastal sage scrub. Suitable habitat does not occur on site. Would have been observed if present.

Appendix C (cont.)
SENSITIVE PLANT SPECIES OBSERVED
OR WITH POTENTIAL TO OCCUR – HAWANO

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
Munz's sage (<i>Salvia munzii</i>)	--/-- CNPS List 2.2 County Group B	Low. A shrub that occurs in coastal sage scrub and chaparral below 1,500 feet. Suitable shrub habitat does not occur on site.
Parry's tetraococcus (<i>Tetraococcus dioicus</i>)	--/-- CNPS List 1B.2 County Group A	Very low. Occurs in low, moderately dense chamise chaparral. Suitable habitat does not occur on site.

*Refer to Appendix E for a listing and explanation of status and sensitivity codes

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Appendix D

SENSITIVE ANIMAL SPECIES OBSERVED OR WITH POTENTIAL TO OCCUR



Appendix D
SENSITIVE ANIMAL SPECIES OBSERVED
OR WITH POTENTIAL TO OCCUR – HAWANO

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
INVERTEBRATES		
San Diego fairy shrimp (<i>Branchinecta sandiegonensis</i>)	FE/-- County Group 1 MSCP Rare, NE	Observed in 3 road pools on site. Typical habitat includes seasonal pools that occur in tectonic swales or earth slump basins and other areas of shallow and standing water, often in patches of grassland and agriculture interspersed in coastal sage scrub and chaparral.
Monarch butterfly (<i>Danaus plexippus</i>)	--/-- County Group 2	Low. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby. Larval host plants consist of milkweeds (<i>Asclepias</i> sp.). No suitable roosting locations or larval host plants occur on site.
Quino checkerspot butterfly (<i>Euphydryas editha quino</i>)	FE/-- County Group 1 MSCP Rare, NE	Low. Typical habitat includes open sage scrub or grassland with areas of dwarf plantain. Site supports dense cover of tall grasses and mustard with few nectaring resources and no host plant (<i>Plantago erecta</i>) observed.
Harbison's dun skipper (<i>Euphyes vestris harbisoni</i>)	--/-- County Group 1	Low. Host plant San Diego sedge (<i>Carex spissa</i>) not observed on site.
Hermes copper (<i>Lycaena hermes</i>)	--/-- County Group 1	Low. Host plant spiny redberry (<i>Rhamnus crocea</i>) not observed on site.
Thorne's hairstreak (<i>Mitoura thornei</i>)	--/-- County Group 1	Very low. Closely associated with food plant Tecate cypress (<i>Cupressus forbesii</i>) and closed cone forest habitats. Appropriate habitat does not occur on or near the site.
Riverside fairy shrimp (<i>Streptocephalus woottoni</i>)	FE/-- County Group 1 MSCP Rare, NE	Observed in 1 road pool on site and 1 road pool off site. Typically occurs in deep vernal pools and seasonal wetlands.
VERTEBRATES		
Amphibians and Reptiles		
Silvery legless lizard (<i>Anniella nigra argentea</i>)	--/SSC County Group 2	Low. Burrows in loose soils, sandy washes, or leaf litter. Occurs in moist habitats of chaparral, pine, and oak woodlands, and riparian streamside growth. Suitable habitat does not occur on site.

Appendix D (cont.)
SENSITIVE ANIMAL SPECIES OBSERVED
OR WITH POTENTIAL TO OCCUR – HAWANO

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
VERTEBRATES (cont.)		
Amphibians and Reptiles (cont.)		
Arroyo toad (<i>Bufo californicus</i>)	FE/SSC County Group 1	None. Found in washes, streams, and arroyos in semiarid areas. Prefer shallow pools and open, sandy stream terraces or sand bars with cottonwoods, willows, or sycamores. Suitable habitat does not occur on site.
Orange-throated whiptail (<i>Aspidoscelis hyperythra</i>)	--/SSC County Group 2	Low to moderate. Prefers scrub habitats with patches of brush and rocks for cover. Project site is dominated by grasslands and suitable shrub cover is not present.
San Diego banded gecko (<i>Coleonyx variegates abbottii</i>)	--/-- County Group 1	Low. Chaparral and coastal sage scrub in areas with rock outcrops are preferred habitats. Suitable habitat does not occur on site.
Red-diamond rattlesnake (<i>Crotalus ruber ruber</i>)	--/SSC County Group 2	Low. Occurs in coastal sage scrub and chaparral with abundant rocky outcrops. Suitable conditions do not occur on site.
Coronado skink (<i>Eumeces skiltonianus interparietalis</i>)	--/SSC County Group 2	Low to moderate. Occurs in grassland, scrublands, and cismontane woodlands with abundant leaf litter. Marginally suitable habitat occurs on site.
Coastal rosy boa (<i>Charina trivirgata</i>)	--/SSC County Group 2	Low. Generally occurs in coastal sage scrub, particularly where rock outcrops are common. Suitable scrub habitat does not occur on site.
Coast horned lizard (<i>Phrynosoma coronatum</i>)	--/SSC County Group 2	Low. Prefers friable, rocky, or shallow soils in coastal sage scrub or chaparral. Require the presence of primary food source, harvester ants (<i>Pogonomyrmex</i> sp.). Suitable scrub habitat does not occur on site.
Coast patch-nosed snake (<i>Salvadora hexalepis virgultea</i>)	--/SSC County Group 2	Low. Found in coastal sage scrub, chaparral, riparian, grasslands, and agricultural fields (Zeiner et al. 1988). Prefers open habitats with friable or sandy soils, burrowing rodents for food, and enough cover to escape being preyed upon. Marginally suitable habitat occurs on site.

Appendix D (cont.)
SENSITIVE ANIMAL SPECIES OBSERVED
OR WITH POTENTIAL TO OCCUR – HAWANO

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
VERTEBRATES (cont.)		
Amphibians and Reptiles (cont.)		
Western spadefoot toad (<i>Spea hammondi</i>)	--/SSC County Group 2	Observed in 1 road pool on site. Typical breeding habitat is open sage scrub, chaparral, or grasslands where there are temporary pools and friable soils.
Two-striped garter snake (<i>Thamnophis hammondi</i>)	---/SSC County Group 1	Low. Typical habitat is along permanent and intermittent streams bounded by dense riparian vegetation; also found in vernal pools and stock ponds. Suitable habitat does not occur on site.
Birds		
Cooper's hawk (<i>Accipiter cooperii</i>)	--/WL County Group 1	Low to moderate. Tends to inhabit lowland riparian areas and oak woodlands in proximity to suitable foraging areas such as scrublands or fields. Although no suitable nesting habitat occurs on site, foraging habitat is abundant.
Tricolored blackbird (<i>Agelaius tricolor</i>)	BCC/SSC County Group 1	Low. Occurs mostly in coastal lowland grasslands and wetlands. Would have been observed if present.
Southern California rufous-crowned sparrow (<i>Aimophila ruficeps canescens</i>)	--/WL County Group 1	Low. Occurs in coastal sage scrub on rocky hillsides and in canyons; also found in open sage scrub/grassy areas of successional growth. Suitable scrub habitat does not occur on site.
Grasshopper sparrow (<i>Ammodramus savannarum</i>)	--/SSC County Group 1	One individual observed in non-native grassland the central portion of the site. Typical habitat is dense grasslands that have little or no shrub cover.
Bell's sage sparrow (<i>Amphispiza belli belli</i>)	--/SSC County Group 1	Very low. Occurs in sunny, dry stands of coastal sage scrub or chaparral. Suitable scrub habitat does not occur on site.
Golden eagle (<i>Aquila chrysaetos</i>)	BCC; BGEPA/WL; Fully Protected MSCP Rare, NE County Group 1	Low to moderate. Typical foraging habitat includes grassy and open, shrubby habitats. Generally nests on remote cliffs; requires areas of solitude at a distance from human habitation. Suitable foraging habitat occurs on site.

Appendix D (cont.)
SENSITIVE ANIMAL SPECIES OBSERVED
OR WITH POTENTIAL TO OCCUR – HAWANO

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
VERTEBRATES (cont.)		
Birds (cont.)		
Great blue heron (<i>Ardea herodias</i>)	--/-- County Group 2	Low. Typically found in wetland habitats, but can be observed foraging away from water. Suitable habitat does not occur on site.
Burrowing owl (<i>Athene cunicularia</i>)	BCC/SSC MSCP Rare, NE County Group 1	A total of 2 occupied burrows and 5 individuals were observed on site or in the off site improvement areas. Typical habitat is grasslands, open scrublands, agricultural fields, and other areas where there are ground squirrel burrows or other areas in which to burrow.
Ferruginous hawk (<i>Buteo regalis</i>)	BCC/WL County Group 1	Low to moderate. Species is an uncommon winter visitor to grasslands in San Diego County. Species could use site as foraging habitat in the winter.
Coastal cactus wren (<i>Campylorhynchus brunneicapillus sandiegonensis</i>)	BCC/SSC County Group 1	Very low. Occurs in coastal sage scrub with large cacti for nesting. No suitable habitat occurs on site.
Turkey vulture (<i>Cathartes aura</i>)	--/-- County Group 1	One (1) individual observed soaring over central portion of the site. Species occurs throughout much of San Diego County with the exception of extreme coastal San Diego where development is heaviest. Foraging habitat includes most open habitats with breeding occurring in crevices among boulders.
Northern harrier (<i>Circus cyaneus</i>)	--/SSC County Group 1	One (1) individual observed foraging in the southwest portion of the site. Typical habitat includes grasslands, meadows, marshlands, and prairies.
White-tailed kite (<i>Elanus leucurus</i>)	--/Fully Protected County Group 1	Moderate. Typical nesting habitat includes riparian woodlands and oak and sycamore groves. Foraging occurs over grassland habitats, which occur on site.

Appendix D (cont.)
SENSITIVE ANIMAL SPECIES OBSERVED
OR WITH POTENTIAL TO OCCUR – HAWANO

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
VERTEBRATES (cont.)		
Birds (cont.)		
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	FE/SE County Group 1	None. Breeds within thickets of willows or other riparian understory usually along streams, ponds, lakes, or canyons. Migrants may be found among other shrubs in wetter areas. Suitable habitat does not occur on site.
California horned lark (<i>Eremophila alpestris actia</i>)	--/WL County Group 2	One (1) individual observed along the eastern site boundary. Typical habitat includes sandy beaches, agricultural fields, grassland, and open areas.
Prairie falcon (<i>Falco mexicanus</i>)	BCC/WL County Group 1	Low. Nests on cliffs or bluffs and forage over open desert scrub or grassland. Although potential foraging habitat occurs on site, it is largely disturbed and urbanized.
Peregrine falcon (<i>Falco peregrinus</i>)	Delisted; BCC/SE; Fully Protected County Group 1	Low. Rare fall and winter visitor. Prefers various coastal habitats for foraging and breeding.
Loggerhead shrike (<i>Lanius ludovicianus</i>)	--/SSC County Group 1	One (1) individual observed just off site to the southeast. Typical habitat includes open habitats including grasslands, shrublands, and ruderal areas with adequate perching locations.
Long-billed curlew (<i>Numenius amaericanus</i>)	BCC/WL County Group 2	Very low. Occurs on tidal mudflats and open coastal grassland. Grasslands on site are largely unsuitable.
Coastal California gnatcatcher (<i>Polioptila californica californica</i>)	FT/SSC County Group 1	Very low. Generally occurs in coastal sage scrub and very open chaparral. No suitable scrub habitat occurs on site.
Least Bell's vireo (<i>Vireo bellii pusillus</i>)	BCC/SE County Group 1	None. Prefers riparian woodland forest and is most frequent in dense, young willows, or mule fat understory areas with a canopy of tall willows. Currently restricted to major river systems in San Diego County. Suitable habitat does not occur on site.

Appendix D (cont.)
SENSITIVE ANIMAL SPECIES OBSERVED
OR WITH POTENTIAL TO OCCUR – HAWANO

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
VERTEBRATES (cont.)		
Mammals		
Pallid bat (<i>Antrozous pallidus pacificus</i>)	--/SSC County Group 2	Low. Roosts in caves, mines, bridges, crevices, and abandoned buildings and trees. Appropriate roosting habitat absent. Could forage throughout the site, but few potential roosting sites exist.
California pocket mouse (<i>Chaetodipus californicus femoralis</i>)	--/SSC County Group 2	Very low. Occurs in coastal sage scrub, chaparral, grasslands, and woodland habitats up to 7,900 feet. Suitable habitat does not occur on site.
San Diego pocket mouse (<i>Chaetodipus fallax fallax</i>)	--/SSC County Group 2	Low. Found in open areas of coastal sage scrub and weedy growth, often on sandy substrates. Although weedy grassland is abundant, suitable scrub cover is absent.
Spotted bat (<i>Euderma maculatum</i>)	--/SSC County Group 2	Very low. Roost in cliff cracks and outcrops; forage over open marshlands. No suitable roosting or foraging habitat occurs on site.
Greater western mastiff bat (<i>Eumops perotis californicus</i>)	--/SSC County Group 2	Very low. Roosts in crevices in cliff faces, and presence strongly tied to large (100 feet long or more) ponds for drinking. No suitable foraging or roosting habitat occurs on site.
San Diego black-tailed jackrabbit (<i>Lepus californicus bennettii</i>)	--/SSC County Group 2	One (1) individual observed in non-native grassland in the central portion of the site. Occurs primarily in open habitats including coastal sage scrub, chaparral, grasslands, croplands, and open, disturbed areas if there is at least some shrub cover present.
Yuma myotis (<i>Myotis yumanensis</i>)	--/-- County Group 2	Very low. Occurs in arid areas where it roosts in buildings, mines, caves, and crevices, and forages over permanent water sources. No suitable roosting or foraging habitat occurs on site.

Appendix D (cont.)
SENSITIVE ANIMAL SPECIES OBSERVED
OR WITH POTENTIAL TO OCCUR – HAWANO

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
VERTEBRATES (cont.)		
Mammals (cont.)		
San Diego desert woodrat (<i>Neotoma lepida intermedia</i>)	--/SSC County Group 2	Very low. Occurs in open chaparral and coastal sage scrub, often building large, stick nests in rock outcrops or around clumps of cactus or yucca. No suitable shrub cover occurs on site.
Big free-tailed bat (<i>Nyctinomops macrotis</i>)	--/SSC County Group 2	Very low. Typically observed in rocky areas. Roost in rocky cliffs, sometimes caves, buildings, or tree holes. Suitable habitat is not present on site.
Pocketed free-tailed bat (<i>Nyctinomops femorosaccus</i>)	--/SSC County Group 2	Very low. Typically observed in desert habitat, where it roosts in rock outcrops. Suitable habitat is not present on site.
Southern mule deer (<i>Odocoileus hemionus</i>)	--/-- County Group 2	Low. Habitat includes coastal sage scrub, riparian and montane forests, chaparral, grasslands, croplands, and open areas if there is at least some scrub cover present. Crepuscular activity and movements are along routes that provide the greatest amount of protective cover. Site supports only marginally suitable habitat and this species has not been documented in the numerous surveys that have been completed for this site and adjacent sites.
Southern grasshopper mouse (<i>Onychomys torridus ramona</i>)	--/SSC County Group 2	Very low. Generally found in desert habitats with loose, friable soils. Less common in coastal scrub and chaparral. Suitable shrub cover does not occur on site.
Pacific pocket mouse (<i>Perognathus longimembris pacificus</i>)	FE/SSC County Group 1	Low. Found in coastal sage scrub, but more often in sandy washes. Known currently from one location in Orange County and one on Camp Pendleton. Site outside of species' known range.

Appendix D (cont.) SENSITIVE ANIMAL SPECIES OBSERVED OR WITH POTENTIAL TO OCCUR – HAWANO		
SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR
VERTEBRATES (cont.)		
Mammals (cont.)		
Townsend's big-eared bat (<i>Plecotus townsendii pallescens</i>)	--/SSC County Group 2	Very low. Typically roosts in caves and mines and forages for moths in forested areas. No suitable roosting or foraging habitat occurs on site.
American badger (<i>Taxidea taxus</i>)	--/SSC County Group 2`	Very low. Habitat includes open plains and prairies, farmland, and sometimes edges of woods. The site's proximity to urban development and frequent visitation by vehicles and people make this species unlikely to occur.

*Refer to Appendix E for a listing and explanation of status and sensitivity codes



Appendix E

EXPLANATION OF STATUS CODES FOR PLANT AND ANIMAL SPECIES



Appendix E

EXPLANATION OF STATUS CODES FOR PLANT AND ANIMAL SPECIES

FEDERAL, STATE, AND LOCAL CODES

U.S. Fish and Wildlife Service (USFWS)

FE	Federally listed endangered
FT	Federally listed threatened
BCC	Birds of Conservation Concern (discussed in more detail, below)
BGEPA	Bald and Golden Eagle Protection Act (discussed in more detail below)

California Department of Fish and Game (CDFG)

SE	State listed endangered
SR	State listed rare
ST	State listed threatened
SSC	State species of special concern
WL	Watch List

Fully Protected Fully Protected species refer to all vertebrate and invertebrate taxa of concern to the Natural Diversity Data Base regardless of legal or protection status. These species may not be taken or possessed without a permit from the Fish and Game Commission and/or CDFG.

County of San Diego

Plant sensitivity:

Group A	Plants rare, threatened, or endangered in California or elsewhere
Group B	Plants rare, threatened, or endangered in California but more common elsewhere
Group C	Plants that may be quite rare, but more information is needed to determine rarity status
Group D	Plants of limited distribution and are uncommon, but not presently rare or endangered

Animal sensitivity:

County Sensitive	Animals considered under California Environmental Quality Act (CEQA) review of projects.
------------------	--

Multiple Species Conservation Program (MSCP) Covered

Multiple Species Conservation Program covered species for which the County has take authorization within the MSCP area.

MSCP Narrow Endemic (NE)

Narrow endemic species are native species that have “restricted geographic distributions, soil affinities, and/or habitats.” The MSCP participants’ subarea plans have specific conservation measures to ensure impacts to narrow endemics are avoided to the maximum extent practicable.

Appendix E (cont.)
EXPLANATION OF STATUS CODES FOR PLANT AND ANIMAL SPECIES

OTHER CODES AND ABBREVIATIONS

USFWS Bald and Golden Eagle Protection Act (BGEPA)

In 1782, Continental Congress adopted the bald eagle as a national symbol. During the next one and a half centuries, the bald eagle was heavily hunted by sportsmen, taxidermists, fisherman, and farmers. To prevent the species from becoming extinct, Congress passed the Bald Eagle Protection Act in 1940. The Act was extremely comprehensive, prohibiting the take, possession, sale, purchase, barter, or offer to sell, purchase, or barter, export or import of the bald eagle “at any time or in any manner.”

In 1962, Congress amended the Eagle Act to cover golden eagles, a move that was partially an attempt to strengthen protection of bald eagles, since the latter were often killed by people mistaking them for golden eagles. The golden eagle, however, is accorded somewhat lighter protection under the Act than the bald eagle. Another 1962 amendment authorizes the Secretary of the Interior to grant permits to Native Americans for traditional religious use of eagles and eagle parts and feathers.

USFWS Birds of Conservation Concern (BCC)

This report from 2002 aims to identify accurately the migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent USFWS’ highest conservation priorities and draw attention to species in need of conservation action. USFWS hopes that by focusing attention on these highest priority species, the report will promote greater study and protection of the habitats and ecological communities upon which these species depend, thereby ensuring the future of healthy avian populations and communities. The report is available online at <http://migratorybirds.fws.gov/reports/bcc2002.pdf>.

Appendix E (cont.)
EXPLANATION OF STATUS CODES FOR PLANT AND ANIMAL SPECIES

OTHER CODES AND ABBREVIATIONS (cont.)

California Native Plant Society (CNPS) Codes

Lists

- 1A = Presumed extinct.
- 1B = Rare, threatened, or endangered in California and elsewhere. Eligible for state listing.
- 2 = Rare, threatened, or endangered in California but more common elsewhere. Eligible for state listing.
- 3 = Distribution, endangerment, ecology, and/or taxonomic information needed. Some eligible for state listing.
- 4 = A watch list for species of limited distribution. Needs monitoring for changes in population status. Few (if any) eligible for state listing.

List/Threat Code Extensions

- .1 – Seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)
- .2 – Fairly endangered in California (20 to 80 percent occurrences threatened)
- .3 – Not very endangered in California (less than 20 percent of occurrences threatened, or no current threats known)

A “CA Endemic” entry corresponds to those taxa that only occur in California.

All List 1A (presumed extinct in California) and some List 3 (need more information; a review list) plants lacking threat information receive no extension. Threat Code guidelines represent only a starting point in threat level assessment. Other factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are considered in setting the Threat Code.

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Appendix F

EXCERPT FROM 2006 SR 11 JURISDICTIONAL DELINEATION REPORT



STATE ROUTE 11 AND EAST OTAY MESA PORT-OF-ENTRY

JURISDICTIONAL DELINEATION REPORT

September 21, 2006

Prepared for :

BOYLE ENGINEERING CORPORATION
7807 Convoy Court, Suite 200
San Diego, California 92111

and

STATE OF CALIFORNIA
Department of Transportation
District 11, Environmental Division
4050 Taylor Street
San Diego, California 92110

Prepared by :

HELIX ENVIRONMENTAL PLANNING, INC.
7578 El Cajon Boulevard, Suite 200
La Mesa, California 91941



Stacy Nigro
Principal Delineator

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: SR-11 City/County: San Diego Sampling Date: 4/20/06
 Applicant/Owner: Caltrans State: CA Sampling Point: 2
 Investigator(s): S. Nigro Section, Township, Range: 31/18S/1E
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): C Lat: 32° 33' 22.20" N Long: 116° 55' 22.68" W Datum: _____
 Soil Map Unit Name: Salinas clay, 0-2% slopes (ScA) NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
Remarks: <u>Not Corps or CDFG, an isolated, artificial feature</u>		

VEGETATION Freshwater marsh

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>N/A</u>				Number of Dominant Species That Are OBL, FACW, or FAC:	<u>2</u> (A)
2. _____				Total Number of Dominant Species Across All Strata:	<u>2</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100</u> (A/B)
4. _____					
Total Cover: _____					
Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:	
1. <u>Salix goodenii</u>			<u>FACW</u>	Total % Cover of:	Multiply by:
2. <u>Tamarix sp</u>			<u>FAC</u>	OBL species _____	x 1 = _____
3. _____				FACW species _____	x 2 = _____
4. _____				FAC species _____	x 3 = _____
5. _____				FACU species _____	x 4 = _____
Total Cover: _____				UPL species _____	x 5 = _____
				Column Totals:	(A) _____ (B) _____
				Prevalence Index = B/A = _____	
Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:	
1. <u>Typha latifolia</u>		<u>X</u>	<u>OBL</u>	Dominance Test is >50%	
2. <u>Phragmites monspeliensis</u>		<u>X</u>	<u>FACW</u>	Prevalence Index is ≤3.0 ¹	
3. <u>Lythrum hyssopifolium</u>			<u>FACW</u>	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
4. <u>Cyperus sp</u>			<u>FACW</u>	Problematic Hydrophytic Vegetation ¹ (Explain)	
5. <u>Isotria medeoloides</u>			<u>FAC*</u>		
6. <u>Phalaris sp.</u>			<u>FAC/FACW</u>		
7. _____					
8. _____					
Total Cover: _____					
Woody Vine Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present?	
1. <u>N/A</u>				Yes <u>X</u> No _____	
2. _____					
Total Cover: _____					
% Bare Ground in Herb Stratum _____	% Cover of Biotic Crust <u>0</u>				

Remarks: Field work conducted prior to implementation of Arid West Manual. As such, absolute cover data was not available, only dominant vs. non-dominant.

CDFG habitat. This sample plot met only one of the Corps wetland criteria (vegetation) and does not exhibit an ordinary high water mark (OHWM); it therefore was not considered Corps jurisdictional.

Sample Plot 2. This sample plot was located in freshwater marsh in the southwestern portion of the study area. Two wetland plants (broad-leaved cattail and rabbitsfoot grass) were dominant, thus meeting the wetland vegetation criterion. Several wetland plants were present as non-dominant species, including black willow (*Salix gooddingii*), grass poly (*Lythrum hyssopifolium*), sedge (*Cyperus* sp.), ryegrass (*Lolium* sp.), tamarisk (*Tamarix* sp.), and canary grass (*Phalaris* sp.). Wetland hydrology was indicated by inundation. No pit was excavated due to inundation of the sample plot. Hydric soils were assumed present based on an aquic moisture regime, as the plot was inundated during the dry season and supported a dominance of obligate and facultative wetland plants. This area is a man-made swale fed by urban and irrigation run-off coming from an adjacent landscaped berm, a brow ditch, and a culvert outlet. Water conveyed through the swale collects at the edge of and within the adjacent road and then sheet flows into non-native grassland to the south; it does not flow into a drainage. Although the sample plot met the three Corps wetland criteria, it was considered a non-jurisdictional feature for both Corps and CDFG because it was artificially created and is not within an area of natural flood conveyance.

Sample Plot 3. This sample plot was located in freshwater marsh in the southeastern portion of the study area, in the upper reaches of Drainage D. Three wetland plants (broad-leaved cattail, slender creeping spike-rush, and rabbitfoot grass) were dominant, thus meeting the wetland vegetation criterion. Non-dominant species were African brass-buttons (*Cotula coronopifolia*) and curly dock, both of which are wetland species. Wetland hydrology was indicated by inundation and drainage patterns in wetlands. Hydric soils were indicated by the presence of an aquic moisture regime: water ponding in this portion of the drainage supports a thick growth of obligate and facultative wetland plants. This sample plot met all three wetland criteria and is both Corps and CDFG jurisdictional.

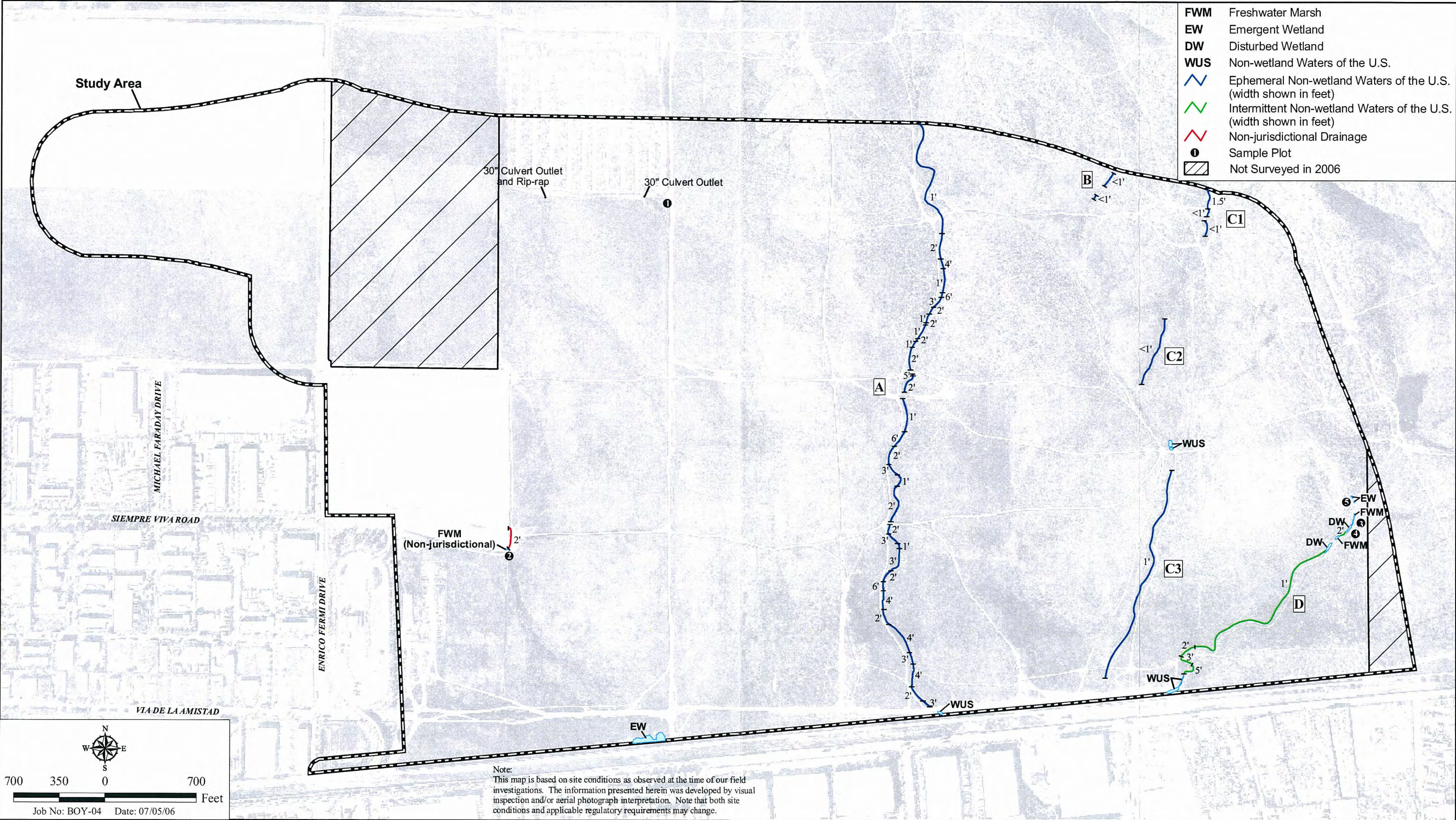
Sample Plot 4. This sample plot was located in Drainage D just downstream of Sample Plot 3. One wetland plant (rabbitsfoot grass) was dominant, thus meeting the wetland vegetation criterion. Curly dock, also a wetland plant, was present as a non-dominant species. Wetland hydrology was indicated by soil saturation and drainage patterns in wetlands. A soil pit excavated to 8 inches revealed the presence of low-chroma colors, a hydric soil indicator. This sample plot met all three wetland criteria and is both Corps and CDFG jurisdictional.

Sample Plot 5. This sample plot was located in a pocket of emergent wetland upstream of Sample Plot 3. Two wetland plants (slender creeping spike-rush and salt heliotrope) were dominant, thus meeting the wetland vegetation criterion. One wetland plant (grass poly) was present as a non-dominant species. Wetland hydrology was indicated by drainage patterns in wetlands. A soil pit excavated to 8 inches revealed the presence of low-chroma colors, a hydric soil indicator. This sample plot met all three wetland criteria and is both Corps and CDFG jurisdictional.

C. JURISDICTIONAL HABITATS

Descriptions of the jurisdictional habitats observed in the study area (disturbed mule fat scrub, freshwater marsh, emergent wetland, disturbed wetland, and non-wetland WUS/CDFG streambed) are provided below. Other habitats identified in the study area (vernal pools, Diegan coastal sage scrub, native grassland, non-native grassland, eucalyptus woodland, tamarisk scrub, disturbed habitat, and developed land; Figure 3) are also described below.

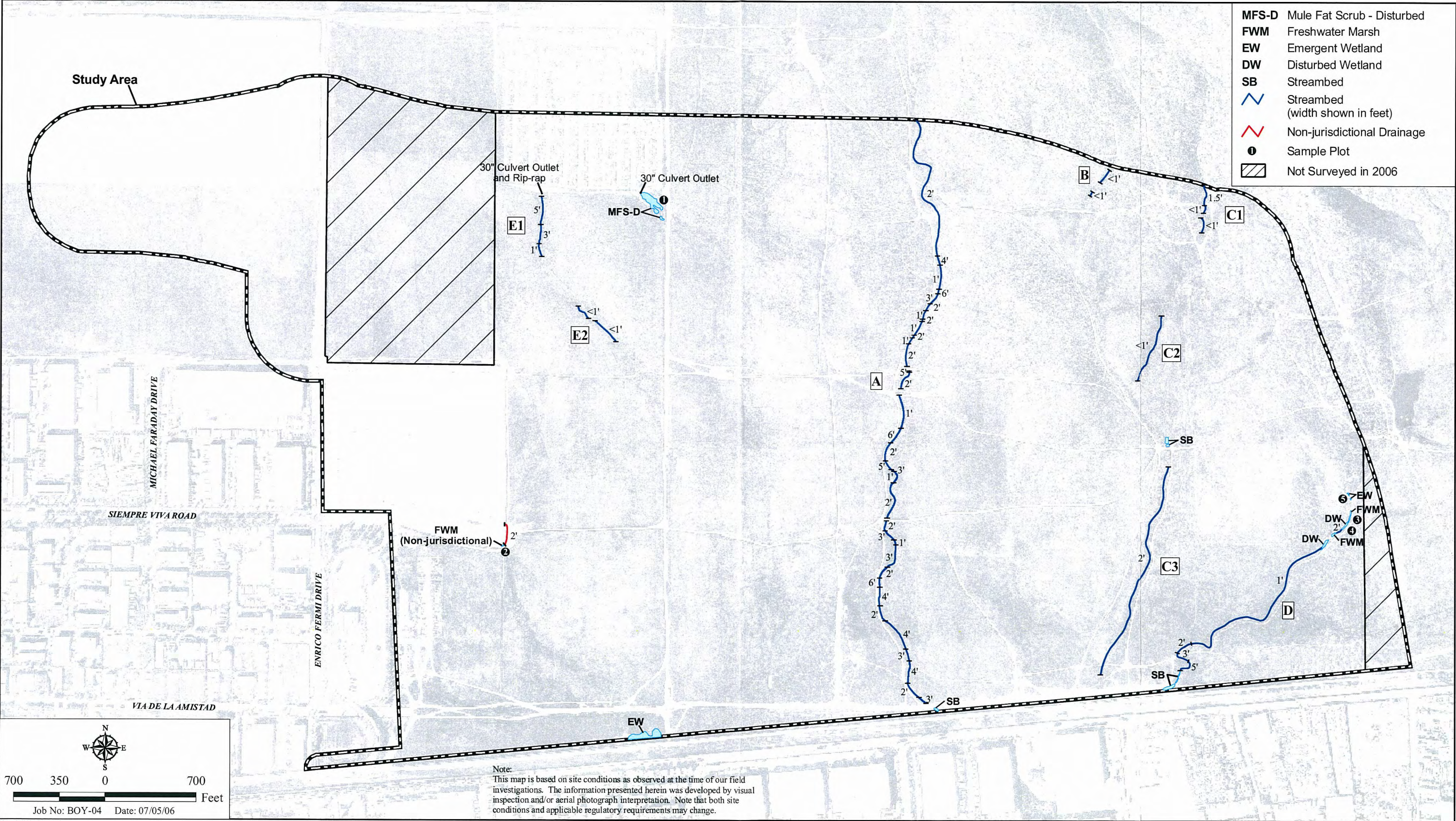
HELIX



Corps Jurisdictional Features

STATE ROUTE 11 AND EAST OTAY MESA PORT-OF-ENTRY

Figure 4



CDFG Jurisdictional Features

STATE ROUTE 11 AND EAST OTAY MESA PORT-OF-ENTRY

Figure 5



Photo 1. Sample Plot 1. Looking northeast at CDFG disturbed mule fat scrub in the northern portion of the study area.



Photo 2. Sample Plot 2. Looking southwest at non-jurisdictional freshwater marsh in the western portion of the study area.

Sample Plot and Site Photos

STATE ROUTE 11 AND EAST OTAY MESA PORT-OF-ENTRY

Appendix D



Appendix G

FOCUSED SURVEY REPORTS



APPENDIX INCLUDED ON ENCLOSED CD



Appendix H

VERNAL POOL PRESERVE RESTORATION PLAN



Appendix H

VERNAL POOL PRESERVE RESTORATION PLAN

The following Vernal Pool Preserve Restoration Plan, dated October 17, 2011, was prepared for the approved Otay Business Park (OBP) project (TM 5505). The OBP project is situated adjacent to the proposed Hawano project and is anticipated to be constructed ahead of the Hawano project. If the Hawano project is implemented ahead of OBP, then Hawano will meet a portion of its mitigation requirements by carrying out its respective portion of the habitat restoration identified in the plan, as described in Section 3.4 of the Biological Technical Report for the Hawano project.

Otay Business Park

Vernal Pool Preserve Restoration Plan

October 17, 2011

Prepared for:
Paragon Management Company, LLC
4225 Executive Square, Suite 920
La Jolla, CA 92037

Prepared by:
HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard, Suite 200
La Mesa, CA 91942

Otay Business Park Vernal Pool Preserve Restoration Plan

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LIST OF ACRONYMS

BMO	Biological Mitigation Ordinance
Cal-IPC	California Invasive Plant Council
CDFG	California Department of Fish and Game
cm	centimeter
City	City of San Diego
Corps	U.S. Army Corps of Engineers
County	County of San Diego
DEM	digital elevation model
EOMSP	East Otay Mesa Specific Plan
GIS	Geographic Information System
GPS	Global Positioning System
HELIX	HELIX Environmental Planning, Inc.
Lonestar Parcels	Lonestar Ranch Property
m	meter
MHPA	Multi-Habitat Planning Area
MSCP	Multiple Species Conservation Program
QCB	Quino checkerspot butterfly
RWQCB	Regional Water Quality Control Board
SR	State Route
USFWS	U.S. Fish and Wildlife Service

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1.0 INTRODUCTION

This restoration plan fully mitigates for direct impacts to vernal pools and road pools with fairy shrimp resulting from implementation of the Otay Business Park (proposed project). Additionally, this plan includes mitigation measures for impacts to burrowing owl (*Athene cunicularia*), rare plants, and Quino checkerspot butterfly (*Euphydryas editha quino*; QCB). The mitigation measures identified herein are based on those contained in the Otay Business Park Biological Technical Report (HELIX Environmental Planning, Inc. [HELIX] 2011a). The proposed mitigation is intended to meet the requirements of the Otay Business Park project's U.S. Fish and Wildlife Service (USFWS) Biological Opinion, U.S. Army Corps of Engineers (Corps) Section 404 Individual Permit, California Department of Fish and Game (CDFG) Section 1602 Streambed Alteration Agreement, Regional Water Quality Control Board (RWQCB) Section 401 Water Quality Certification, and County of San Diego (County) Biological Mitigation Ordinance (BMO). All restoration associated with this plan will occur at the Lonestar Ranch Property (Lonestar Parcels).

2.0 PROJECT DESCRIPTION

2.1 DEVELOPMENT PROJECT LOCATION

The project site (Assessor's Parcel Number 648-070-21) and adjacent off-site improvements are located in southeastern Otay Mesa within San Diego County, California (Figure 1). The property lies immediately north of the U.S./Mexico border, approximately one-half mile east of Enrico Fermi Drive. It occupies the southeastern quadrant of Section 31 within Township 18 South, Range 1 East of the U.S. Geological Survey 7.5-minute Otay Mesa quadrangle (Figure 2). The site is within the East Otay Mesa Specific Plan (EOMSP) area and is within areas designated in the County's Multiple Species Conservation Program (MSCP; County 1997) as Minor Amendment Areas and Minor Amendment Areas Subject to Special Consideration.

2.2 DEVELOPMENT PROJECT SUMMARY

The proposed Otay Business Park project is an industrial business park development located on 161.6 acres in Subarea 2 of the EOMSP. Proposed project development would impact 175.31 acres.

2.3 HABITAT/SENSITIVE SPECIES IMPACTS

HELIX prepared a Biological Technical Report that details the impacts and required mitigation for the Otay Business Park project (HELIX 2011a).

2.3.1 Vernal Pools

Implementation of the Otay Business Park project would impact a total of 10 vernal pools with a combined surface area of 0.14 acre (Table 1). Each of the vernal pools had at least one indicator species; however, the indicator species cover did not approach one percent in any pool at any time during the year. The pools are highly disturbed and exhibit very low species cover and

richness. The site has experienced years of agriculture, off-road vehicle use, and Border Patrol activity; most of the pools are almost completely unvegetated throughout the year, including during the rainy season. Vernal pool indicator species that were observed in one or more pools include San Diego button-celery (*Eryngium aristulatum* var. *parishii*), toothed downingia (*Downingia cuspidata*), flowering quillwort (*Lilaea scillioides*), and water pygmyweed (*Crassula aquatica*). Nine of the vernal pools occur on the hill in the south-central portion of the property, and most lie largely within disturbed roads. The largest pool on site (0.08 acre) occurs in a gentle depression on the eastern portion of the site, supports San Diego fairy shrimp (*Branchinecta sandiegonensis*), and is the only pool to contain San Diego button-celery and spreading navarretia (*Navarretia fossalis*). The large pool on the southern boundary supports Riverside fairy shrimp (*Streptocephalus woottoni*).

Table 1 OTAY BUSINESS PARK POOL IMPACTS (acre)	
Habitat	Corps Impacts
Vernal pool	0.14
Road pool	0.10
TOTAL	0.24

2.3.2 Road Pools with Fairy Shrimp

Road pools are ephemeral water-holding basins formed on heavily compacted dirt trails and roads that lack vernal pool indicator plant species (Corps 1997), but support sensitive animal species such as San Diego and Riverside fairy shrimp.

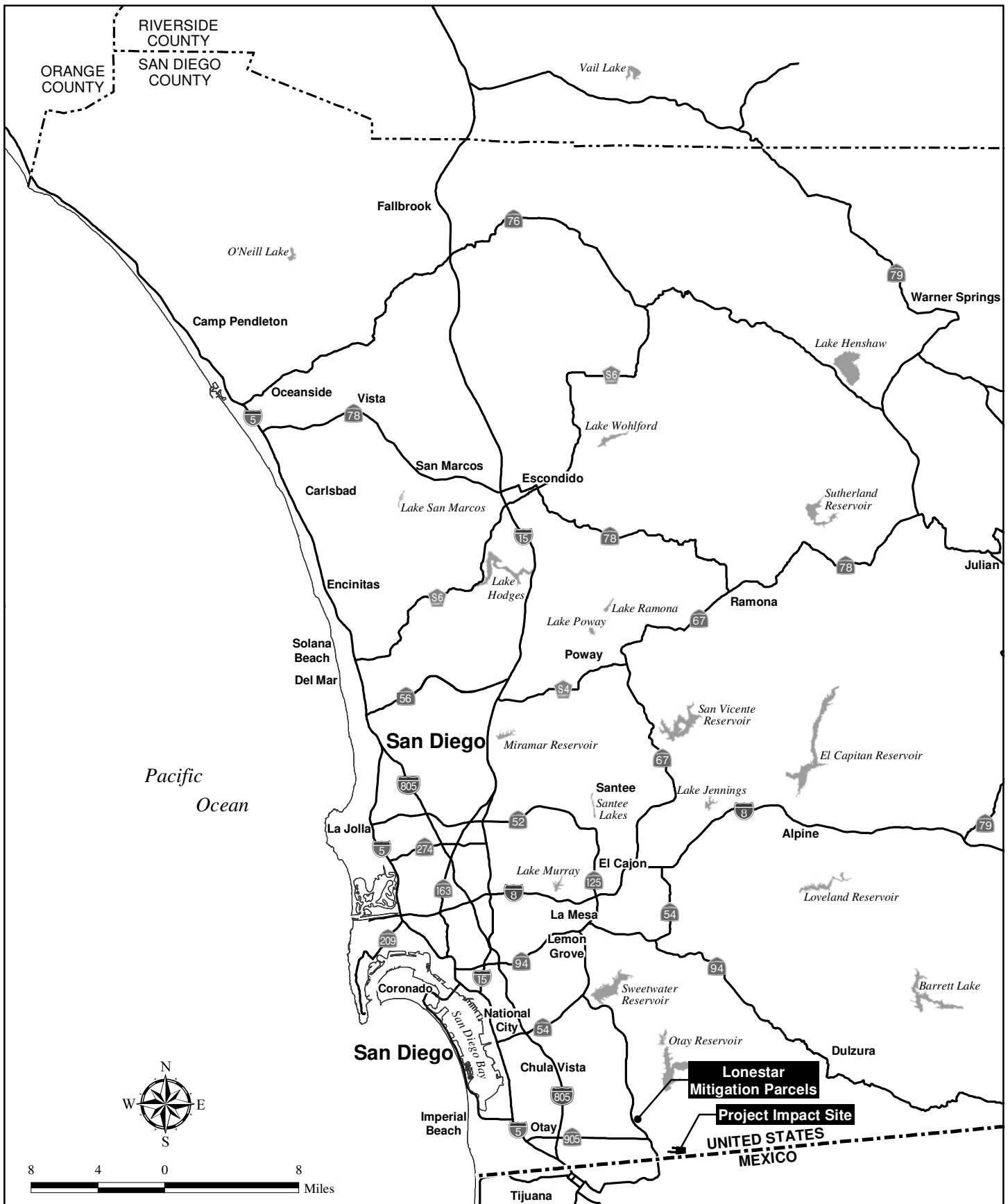
A total of 14 road pools with a combined surface area of 0.10 acre would be impacted by the Otay Business Park project (Table 1).

2.3.3 Burrowing Owl

The proposed project would impact 7 occupied burrowing owl burrows and approximately 175.31 acres of occupied habitat.

2.3.4 Rare Plants

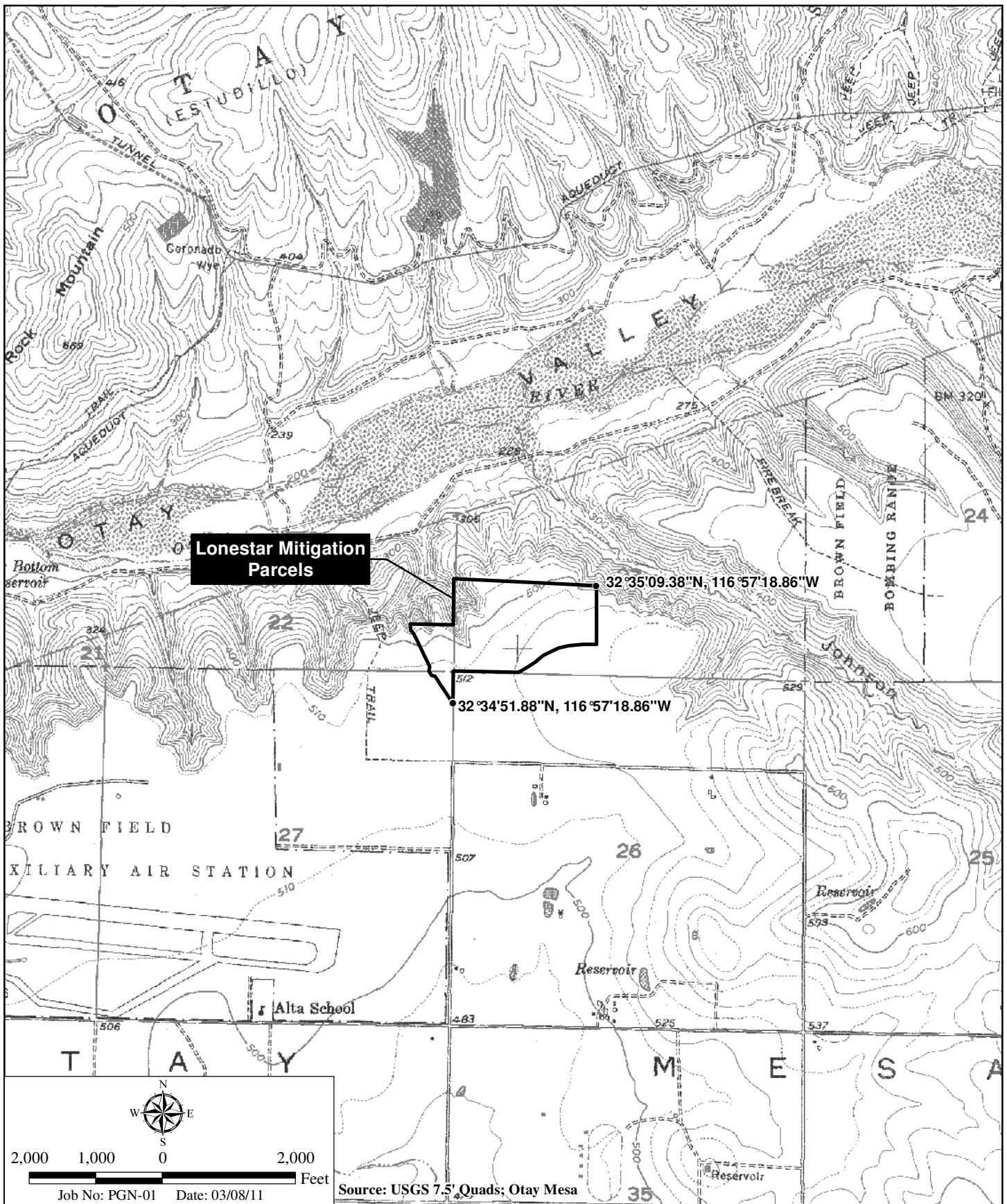
All of the sensitive plants recorded on the project site would be impacted by the proposed development, including small-flowered morning-glory (*Convolvulus simulans*; 5 individuals), variegated dudleya (*Dudleya variegata*; approximately 3,465 individuals), San Diego button-celery (3 individuals), San Diego barrel cactus (*Ferocactus viridescens*; 31 individuals), chocolate lily (*Fritillaria biflora*; 4 individuals), San Diego marsh-elder (11 individuals), and spreading navarretia (3 individuals).



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Regional Location Map

VERNAL POOL PRESERVE RESTORATION PLAN FOR OTAY BUSINESS PARK



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Project Location Map

VERNAL POOL PRESERVE RESTORATION PLAN FOR OTAY BUSINESS PARK

2.3.5 Quino Checkerspot Butterfly Habitat

The QCB observation location on the hill in the southern portion of the project site would be impacted by the proposed project. Dot-seed plantain (*Plantago erecta*) and potential nectar sources are abundant on the upper slopes of this hill, and occur in a scattered distribution within an approximately 3-acre area. Non-native grasslands throughout the site have some limited potential to provide nectaring resources. While QCB have not been observed on site since 2005, the entire 161.6-acre property supports habitat at least marginally suitable to support the QCB.

2.3.6 Functions and Services

The existing functions and services of the impacted vernal pools were assessed using the Individual Vernal Pool Fieldbook of the California Rapid Assessment Method (CRAM) for Wetlands v. 5.0.3 (March 2009). The purpose of the CRAM assessment is to provide a rapid, standardized, and scientifically defensible assessment of the status of a wetland. To conduct this assessment, 2 CRAM practitioners conducted a CRAM assessment according to the User's Manual: California Rapid Assessment Method for Wetlands v. 5.0.2 (Collins et. al., 2008) and other training materials located on the CRAM web site (www.cramwetlands.org). As part of this assessment, a variety of landscape context, hydrology, and structure attributes and metrics were assessed. The CRAM for individual vernal pools has not been fully calibrated; however, it represents a view into the condition of the pools that would otherwise not be represented in the monitoring efforts. Therefore, the CRAM scores will be used primarily for informational purposes and to potentially further the calibration effort on-going in central California. Results of the pre-project and pre-restoration CRAM assessments will be used for later comparison with post-restoration CRAM scores to determine how functions and services were replaced by the rehabilitation effort. Additional monitoring data will also be collected in order to evaluate success off the rehabilitation effort (see Section 8.0).

Five pools proposed to be impacted by project development were assessed on February 27, 2011 by HELIX biologists Sally Trnka and Amy Mattson. CRAM scores varied between 50 and 54 at the assessed pools, with a mean score of 52 (Appendix A). The Buffer and Landscape Context attribute score was between 45 and 48 for all of the analyzed pools due to little surrounding wetland habitat but good-sized buffer habitat dominated by non-native grassland and disturbed habitat. The Hydrology attribute score was high (92) for all of the pools since they all receive water as precipitation, follow the natural patterns of filling and drying, and there is no indication that dry season conditions are substantially controlled by artificial water sources (e.g., urban runoff). The Physical Structure attribute score was low for all of the pools (between 25 and 38) since they are simple depressions with one main slope and without many structural patch types, as defined by the CRAM fieldbook. All of the pools had relatively low scores for the Biotic Structure attribute (between 29 and 42) as a result of the pools being dominated by non-native species, the presence of none or few native species, and no vernal pool indicator species. Scoring sheets for the analyzed pools are included in Appendix A.

3.0 MITIGATION REQUIREMENTS

To ensure no-net-loss of jurisdictional areas as well as associated functions and services, the Corps requires compensatory mitigation for jurisdictional impacts. Jurisdictional impacts and mitigation are assessed by using a function-based assessment tool such as CRAM, coupled with more typical data such as richness of vernal pool flora, presence of target fauna, extent and duration of ponding, and percent cover of native and non-native flora. The Corps encourages the use of this type of function-based assessment for evaluating impacts to aquatic resources, as well as for aiding in establishing appropriate mitigation ratios and determining success criteria.

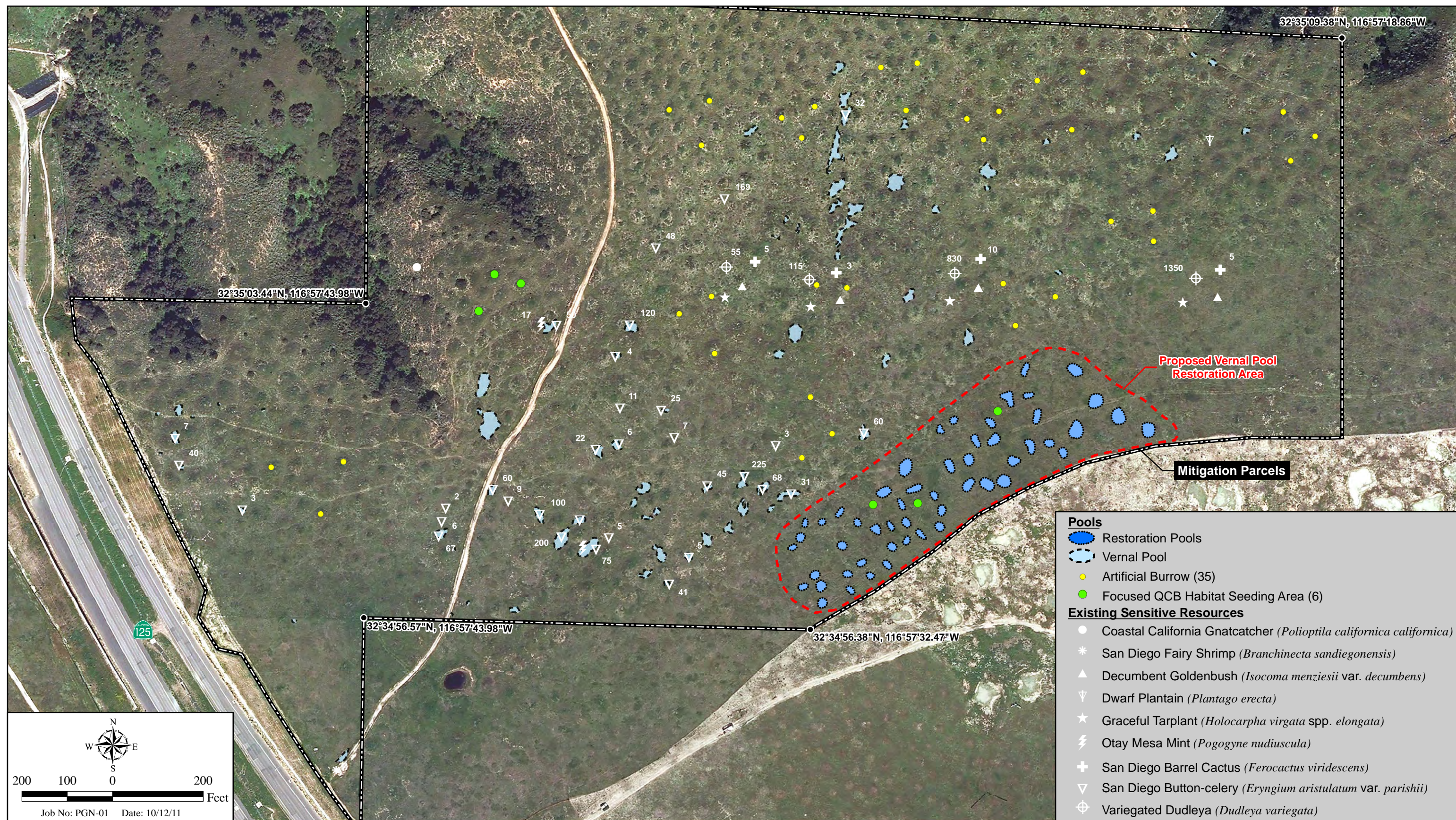
3.1 TYPE(S) OF HABITAT TO BE RESTORED

The total compensatory mitigation for impacts resulting from implementation of the Otay Business Park project is comprised of: on-site restoration and preservation; preservation, restoration, and enhancement of habitat on the 68.7-acre Lonestar parcels (Figures 3 and 4); and preservation of additional habitat at another location off site (for additional non-native grassland mitigation). This restoration plan deals only with the restoration and enhancement of the Lonestar Parcels.

3.2 VERNAL POOLS

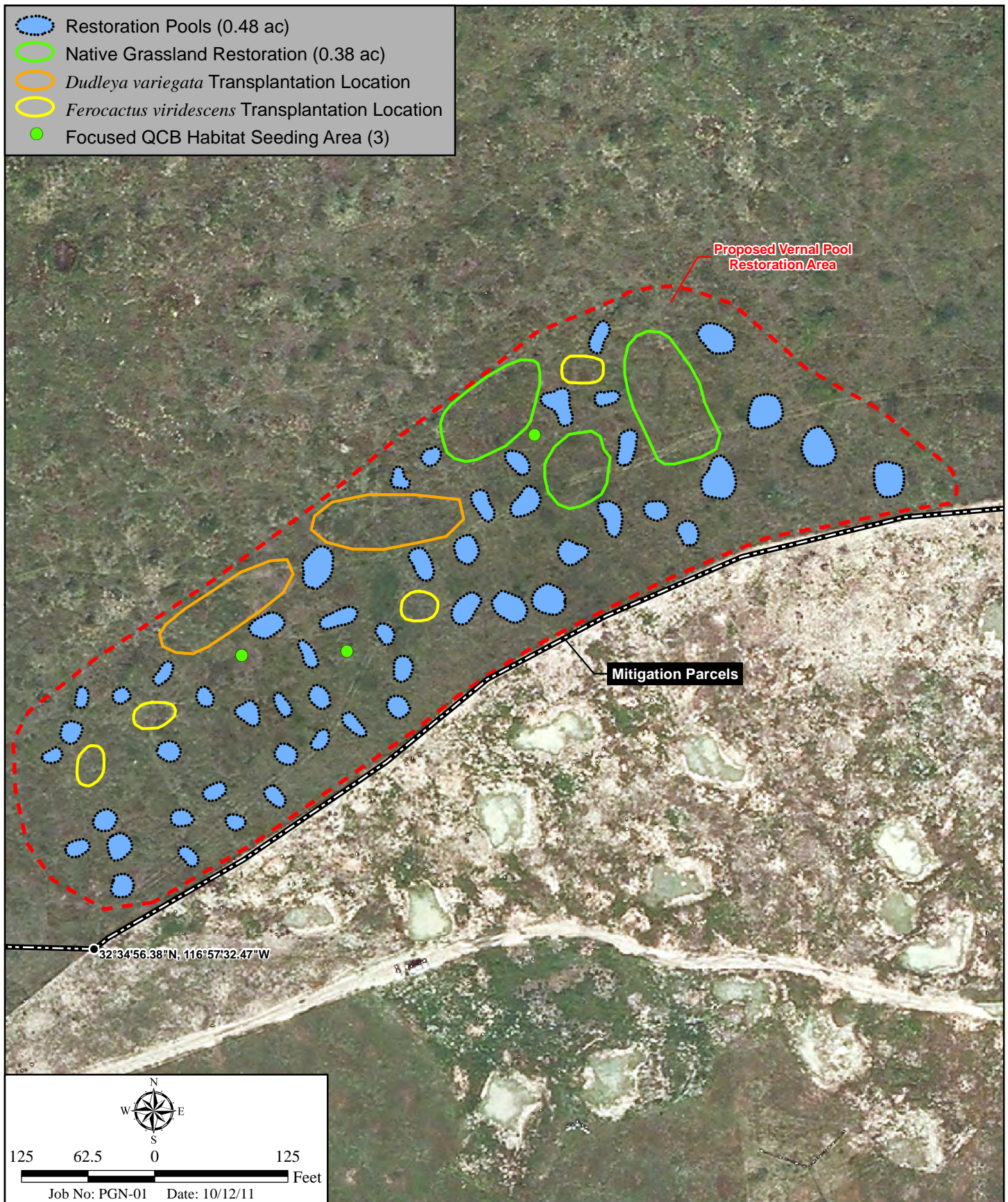
3.2.1 Vernal Pool Restoration and Watershed Enhancement

Mitigation for impacts to vernal pools and road pools with fairy shrimp would occur through vernal pool preservation and restoration on the Lonestar Parcels. Watershed enhancement also would occur at the Lonestar Parcels, which support 0.66 acre of vernal and road pools (Table 2). The preservation of pools refers to protecting existing pools and their associated watersheds from future development. Watershed enhancement involves the periodic removal of grass thatch, but does not include recontouring of existing basins or watersheds. Restoration of pools refers to the re-establishment of basins in appropriate clay soils and mima mound topography that historically supported vernal pools. The mitigation effort would restore 0.48 acre of vernal pools within the Lonestar Parcels. The restored vernal pools would support vernal pool plant indicator species (Corps 1997) and function as viable, self-sustaining vernal pool basins. The total mitigation (1.14 acres) would result in a combined mitigation ratio of approximately 5:1. This includes a vernal pool restoration ratio of 2:1. The mitigation program includes restoration of approximately 4.70 acres of vernal pool watersheds, including 0.38 acre of native grassland restoration



Existing Conditions and Planned Restoration at Lonestar Mitigation Parcels

VERNAL POOL PRESERVE RESTORATION PLAN FOR OTAY BUSINESS PARK



Vernal Pool Restoration Area

VERNAL POOL PRESERVE RESTORATION PLAN FOR OTAY BUSINESS PARK

Table 2 MITIGATION FOR IMPACTS TO VEGETATION COMMUNITIES (acres)						
VEGETATION COMMUNITY	TOTAL IMPACTS	MITIGATION				
		Target		Proposed		
		Ratio	Area	Preservation	Restoration	Total
Vernal/Road pool	0.24	5:1	1.14	0.66	0.48	1.14

3.2.2 San Diego and Riverside Fairy Shrimp Mitigation

The project applicant proposes to mitigate impacts to San Diego and Riverside fairy shrimp at a an approximately 5:1 ratio in conjunction with the vernal and road pool mitigation identified above. This mitigation may include salvage of soil containing fairy shrimp cysts to inoculate the restored pools with San Diego and Riverside fairy shrimp.

3.2.3 San Diego Fairy Shrimp Critical Habitat

The project applicant proposes to offset impacts to 114.4 acres of critical habitat through the preservation and enhancement of 62.2 acres of critical habitat and 1.3 acres of essential habitat located at the Lonestar mitigation site. Measures to improve the value of the critical habitat to San Diego fairy shrimp include the restoration of .48 acres of vernal pools capable of supporting this species and upland habitat restoration within the immediate watershed area (approximately 4.7 acres) of these new pools. The remainder of the mitigation area will be dethatched and subject to periodic removal of non-native grasses. It is anticipated that the removal of the thatch and non-native grasses will help improve the ability of the preserved pools on site to hold water and support the San Diego fairy shrimp (refer to Section 5.9.4). Additional measures to be conducted on the mitigation site include the installation of artificial burrowing owl burrows and introduction of QCB host and nectar plant species.

3.3 BURROWING OWL ARTIFICAL BURROW INSTALLATION

According to the BMO, mitigation for impacts to the occupied habitat must be through the conservation of occupied burrowing owl habitat or lands appropriate for restoration, management, and enhancement of burrowing owl nesting and foraging requirements at a ratio of no less than 1:1 for the territory of the burrowing owl.

The project applicant proposes to partially mitigate impacts to occupied burrowing owl habitat with habitat acquisition and enhancement at the Lonestar Parcels. Suitable habitat occurs throughout the Lonestar Parcels, and burrowing owls have been reported in a number of locations in the vicinity. To ensure suitable burrow opportunities are present within the mitigation area, the installation of 35 artificial burrows is included in the restoration effort.

3.4 RARE PLANT SALVAGE AND TRANSLOCATION

The project applicant proposes to mitigate impacts to variegated dudleya, San Diego button-celery, San Diego barrel cactus, and spreading navarretia through the salvage and translocation of the on-site populations to the Lonestar Parcels, and preservation of translocated and existing populations on the Lonestar parcels. Salvaged variegated dudleya and San Diego barrel cactus would be translocated to the Lonestar Parcels and incorporated into this vernal pool restoration area. San Diego barrel cactus also will be included in the Diegan coastal sage scrub planting palette (Section 5.7.2).

Impacts to chocolate lily would be mitigated with the preservation of 68.72 acres of habitat at the Lonestar Parcels, which includes approximately 50 chocolate lily individuals mapped in the northwestern corner. Chocolate lily seeds would be collected from the Otay Business Park site and applied to the vernal pool watershed restoration area.

Methods for translocation of sensitive plant species are included in this restoration plan in Section 5.5.

3.5 QUINO CHECKERSPOT BUTTERFLY

Because of the low quality habitat on site and small population (one individual observed in 6 years of focused surveys of QCB), the focus of the mitigation effort is on preservation/restoration of appropriate QCB habitat off site, as opposed to any direct attempt at establishing a new population. The project applicant proposes to mitigate for the loss of the QCB through preservation of historically occupied habitat on the Lonestar Parcels, which has been designated as QCB Critical Habitat. Additionally, host plant species and adequate nectar plants will be included in the vernal pool watershed restoration effort, and 6 QCB habitat focused planting areas will be created within the Lonestar parcels. Such measures would improve the habitat value of these historically occupied parcels for the QCB.

3.6 NATIVE GRASSLAND

The project applicant proposes to mitigate impacts to native grassland with the restoration of 0.38 acre of native grassland in the watershed enhancement around the restored vernal pools on the Lonestar Parcels.

4.0 MITIGATION SITE

4.1 LOCATION AND SIZE OF MITIGATION AREA

The project would cause direct and indirect impacts to sensitive vegetation communities, jurisdictional areas, and sensitive plant and animal species. The project applicant proposes to conduct mitigation for the loss of these sensitive resources with on-site preservation and restoration, purchase of mitigation parcels, and restoration within those parcels. The Lonestar Parcels were acquired to serve as partial off-site compensatory mitigation. The Lonestar Parcels

are 2 parcels adjacent to each other totaling 68.72 acres located within the City of San Diego (City), east of State Route (SR)-125 and north of Lonestar Road. These parcels occupy portions of Sections 22, 23, and 27 in Township 18 South, Range 1 West of the U.S. Geological Survey 7.5-minute Otay Mesa quadrangle (Figure 2). These parcels are approximately 3 miles northwest of the project site within the same Otay Mesa burrowing owl sub-population as the project site. All of the habitat on the Lonestar Parcels supports or has potential to support: burrowing owls, non-native grassland, vernal pools, road pools with San Diego fairy shrimp, and Diegan coastal sage scrub. Vernal pools and mima mound topography are present throughout much of the Lonestar Parcels. QCB were historically found in these parcels and the Lonestar Parcels support QCB larval host plants and potential nectar resources. Other County of San Diego sensitive species that occur on the Lonestar Parcels include:

- Otay mesa mint (*Pogogyne nudiscula*; a federal and state listed Endangered species and a County List A species)
- San Diego button-celery (a federal and state listed Endangered species and a County List A species)
- variegated dudleya (a County List A species)
- decumbent goldenbush (*Isocoma menziesii* var. *decumbens*; a County List A species)
- San Diego barrel cactus (a County List B Species)
- graceful tarplant (*Holocarpha virgata* ssp. *elongata*; a County List D species)
- chocolate lily (a County List D species)
- San Diego sunflower (*Viguiera laciniata*; a County List D species)
- Coastal California gnatcatcher (*Poliophtila californica californica*; a County Group 1 species).

The Lonestar Parcels are within the City of San Diego's Multi-Habitat Planning Area (MHPA), with County open space to the north, SR-125 to the west, and the SR-125 vernal pool and burrowing owl mitigation area to the south. The site can be reached by an unnamed dirt road from Lone Star Road. Access will be coordinated with Caltrans and Otay Crossings to minimize disturbance of the overall preserved area.

4.2 LOCATION OF VERNAL POOL RESTORATION

Vernal pool restoration would occur in an approximately 4.7-acre area on the Lonestar Parcels (Figure 4). This area has mima mound topography and non-native grassland. They currently are no vernal pools or water holding depressions within this area. Rare plant translocation would be co-located in the vernal pool restoration area.

4.3 LOCATION OF ENHANCEMENT AREAS

Vernal pool watershed enhancement will occur throughout the entirety of the non-native grasslands within the Lonestar Parcels.

4.4 LOCATION OF ARTIFICIAL OWL BURROWS

The creation of 35 artificial owl burrows will occur throughout the Lonestar Parcels (Figure 3). Artificial burrows would be placed in existing mima mounds and/or disturbed areas as appropriate. The siting of these burrows takes into consideration factors that may affect burrow site suitability (e.g., vegetative cover, relative elevation to surrounding landscape, distance from present/future development, and nearby human activity), spacing between burrows, availability of nearby foraging habitat, and threat of very localized events such as pets, fire, or vandalism.

4.5 OWNERSHIP STATUS

The mitigation site (Lonestar Parcels) has been purchased by Otay Business Park, LLC. Contact information is as follows:

Ricardo Jinich
Otay Business Park, LLC
4225 Executive Square, Suite 920
La Jolla, CA 92037
(858) 535-9000 x 222

As further discussed in Section 9.3, a Biological Open Space Easement or Conservation Easement dedication will be recorded over the vernal pool mitigation areas prior to initiation of project impacts.

4.6 EXISTING FUNCTIONS AND SERVICES OF MITIGATION AREA

The Lonestar Parcels are undeveloped with habitat consisting primarily of non-native grasslands over the mesa top, and high-quality Diegan coastal sage scrub in the canyons. Mima mound topography, one of the main characteristics of San Diego hardpan vernal pools, exists over the majority of the site. At least 7 sensitive plant species (Otay mesa mint, variegated dudleya, San Diego button-celery, decumbent goldenbush, graceful tarplant, chocolate lily, and San Diego barrel cactus) and 2 federally endangered animal species (coastal California gnatcatcher and San Diego fairy shrimp) inhabit the Lonestar Parcels (Figure 3; HELIX 2009).

The site has historically been disturbed by grazing, and by pedestrian and off-highway vehicle usage. The site serves as foraging habitat for migratory birds including sensitive raptor species. The adjacent SR-125 vernal pool restoration site was in the same condition prior to restoration and now, 3 years after installation, it supports successfully restored vernal pool habitat and occupied burrowing owl burrows.

Vernal pools on site support 2 federally endangered plant species (Otay mesa mint and San Diego button-celery). The existing pools hold water for limited amounts of time given average rainfall, making it difficult for these pools to support fairy shrimp. It appears that the dense cover of non-native grasses within the existing pools has a negative effect upon their ability to hold water.

5.0 IMPLEMENTATION PLAN

The restoration at the Lonestar Parcels will consist of several components, including:

- Initial dethatching of the entirety of non-native grassland on the Lonestar Parcels, including mowing of the site and removal of thatch.
- The restoration of 0.48 acre of vernal pools in an approximately 4.70-acre vernal pool restoration area
- The establishment of 0.38 acre of native grassland in the vernal pool restoration area
- The addition of Diegan coastal sage scrub plantings and seeding in the vernal pool restoration area
- Creation of 6 QCB habitat focused seeding areas
- Installation of 35 artificial burrowing owl burrows in mima mounds
- Translocation of rare plants to the vernal pool restoration area
- Enhancement of wildlife habitat

The site preparation, installation, and maintenance of these areas are described in detail in sections 5.4 and 5.5.

The initial cost estimate for site preparation, installation, and 5-year maintenance and monitoring of the mitigation site is approximately \$500,000. Prior to turning the site over to the long-term management entity, a Property Record Analysis (PAR) will be performed to identify the amount of the endowment to be provided for the long term management of the site.

5.1 TARGET FUNCTIONS AND SERVICES

The overall goal of this mitigation effort is to create high quality vernal pools that would at a minimum replace the functions and services lost by project implementation. With the completed restoration, it is expected that functions and services (water filtration, sensitive wildlife and plant habitat, etc.) that are currently being performed by both the existing pools on Lonestar and the reference site pools would be duplicated or improved in the restoration pools by the end of the 5-year mitigation effort. This realization of target functions and services would be documented by conducting CRAM assessments prior to impacts, post-rehabilitation, and at the end of Years 3 and 5 of the mitigation effort.

5.2 RATIONALE FOR EXPECTING IMPLEMENTATION SUCCESS

The mitigation site currently supports non-native grassland habitat with sensitive plant species, vernal pools (some with sensitive species), and potential QCB and burrowing owl habitat. This plan would enhance the watersheds of existing preserved pools, restore vernal pools, install 35 artificial owl burrows, restore native grassland habitat, salvage and translocate rare plants and seed, improve areas of QCB habitat, and implement habitat enhancements for other wildlife species.

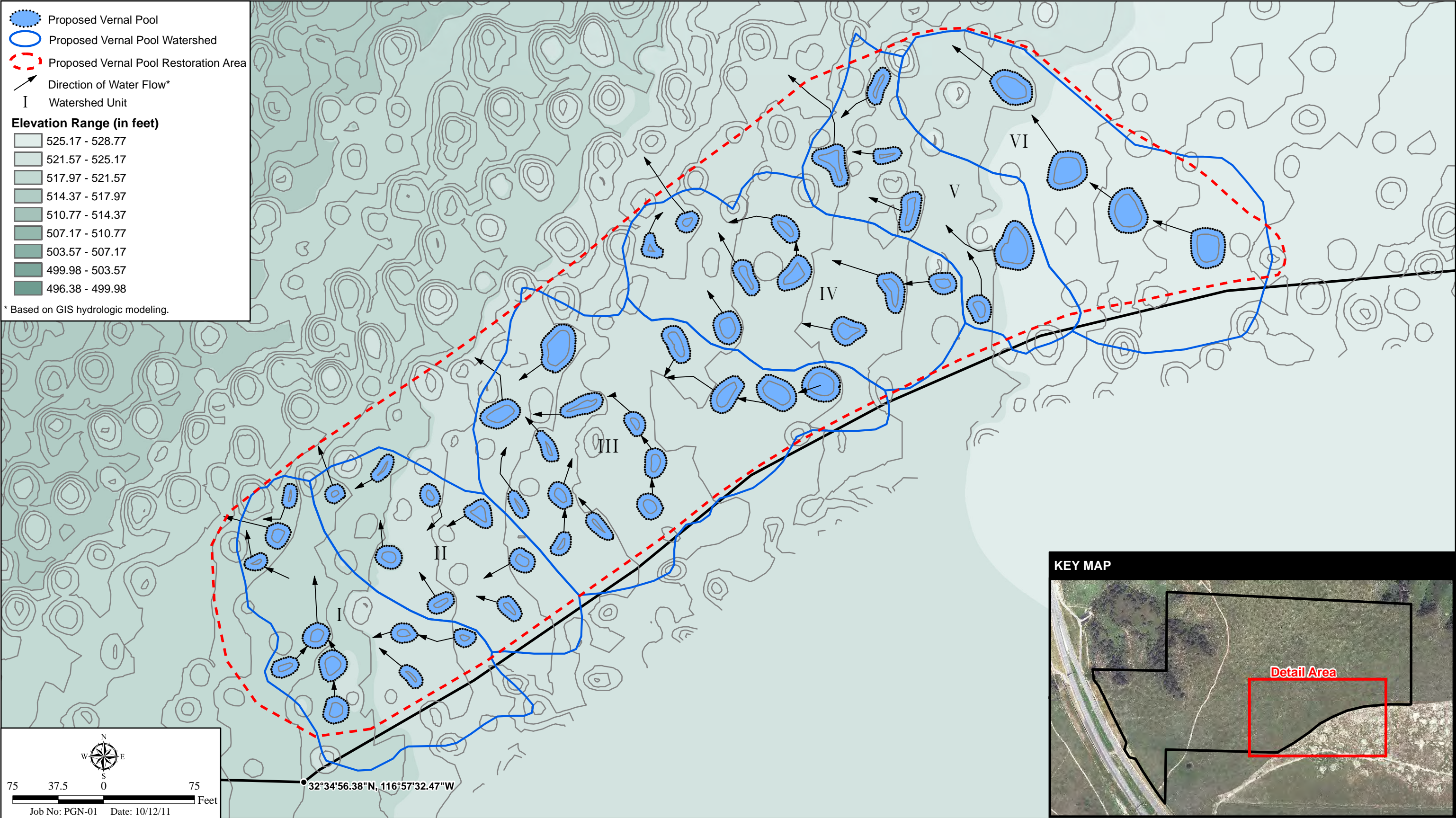
Variegated dudleya, San Diego button-celery, and San Diego barrel cactus have all been observed in grassland habitat on the Lonestar Parcels, so the habitat in these areas would be

appropriate to support the translocated plants and/or seed. Spreading navarretia occurs in vernal pools throughout Otay Mesa, so the vernal pool habitat on the Lonestar Parcels will be appropriate for this species.

A watershed analysis of several mound and basin vernal pool complex maps from Kearny Mesa and Otay Mesa found watershed to pool surface area ratios as low as 4:1, and commonly 6:1 or 7:1 (RECON 1997). Studies have shown that direct precipitation plays a more important role in pool filling than watershed contributions in more porous soils (Hanes and Stromberg 1998), while subsurface flow may have an effect on the duration of ponding.

A hydrological analysis of the proposed vernal pools and surrounding watershed area was conducted to determine the appropriateness of the proposed restoration. This analysis includes a delineation of the specific watershed areas (micro-basins) for each proposed pool complex and models inter-pool surface flows. The micro-basins delineation and modeled surface flows were obtained with a Geographic Information System (GIS) using the hydrological modeling capabilities of ArcView 9.2, and the Spatial Analyst and Arc Hydro GIS tools. A digital elevation model (DEM) was derived from the linear hypsography (6-inch contours) resulting in a raster surface model with one-foot resolution. This DEM acts as the surface upon which all subsequent hydrological modeling was performed. The micro-basin delineation was the result of employing flow direction, flow accumulation, stream channel modeling, and basin modeling in Arc Hydro, the Environmental Systems Research Institute GIS tool for hydrological and water resource analysis. The delineated micro-basins represent a generalization of the output of the GIS analysis, with a number of the modeled lines removed for clarity. The resulting micro-basin delineations (Figure 5) represent “break-lines” that would not likely be crossed by surface flows, thus illustrating the spatial limits (watershed) of potential contributing surface flows for an area. Also derived through hydrological modeling techniques are the flow lines included in the analysis. These lines were derived using the tools in Arc Hydro. The flow lines are not meant to show the location of channelized flow, as might be expected from stream channel modeling in GIS; rather, these lines show the path or direction that water would take from a specific point on a surface. While the flow lines are specific paths that overland flow would follow from a single one foot by one foot location in the study area, they provide a good indication of the general direction and path that flows would follow from a potentially much larger area, until of course they infiltrate into the soil, enter a vernal pool, or channelize, ultimately becoming part of a stream network. Because of the small size and general flat character of the site, channelization is not anticipated to occur on site.

The overall watershed to pool ratio of 9.1:1 is larger than other successful pool complexes and would be sufficient to support the restored vernal pools. Additionally, the project team is comprised of a number of individuals who have been involved in the successful implementation of several vernal pool restoration efforts in San Diego and Riverside counties.



Post-construction Hydrologic Analysis

VERNAL POOL PRESERVE RESTORATION PLAN FOR OTAY BUSINESS PARK

5.3 RESPONSIBLE PARTIES

5.3.1 Project Proponent

Otay Business Park, LLC would be responsible for financing the installation, maintenance, and monitoring of the mitigation measures, including long-term management and monitoring.

5.3.2 Restoration Specialist

Overall supervision of the installation, maintenance, and monitoring of this mitigation project would be the responsibility of a restoration specialist with at least 5 years of vernal pool restoration experience, holding a valid Service permit for identifying fairy shrimp, to be approved by the Service. The restoration specialist will directly oversee all aspects of installation and the minimum 5-year maintenance and monitoring period. The restoration specialist would educate all participants with regard to mitigation goals and requirements and directly oversee grading, excavation, and placement of salvaged topsoil for vernal pool restoration, installation of vernal pool watershed enhancement, artificial owl burrows, focused QCB plantings, and rare plant translocation. In addition, the specialist would conduct all CRAM assessments, other monitoring data collection, and annual assessments, and prepare all required reports. If necessary, the restoration specialist would provide the permittee and contractor with a brief report, including a written list of items in need of attention following each monitoring visit. The contractor would be responsible for carrying out all required measures in a timely manner. The restoration specialist would notify the contractor and responsible party if any requested remediation is not addressed.

5.3.3 Installation/Maintenance Contractor

The installation and maintenance contractor(s) will: have vernal pool habitat restoration experience; be under direction of the restoration specialist; and be responsible for completion of grading, pre-planting weed control, translocation, planting, seeding, and maintenance of the restored and preserved vernal pools and watersheds, and creation and installation of the artificial burrows. The restoration specialist would educate the contractor(s) on the installation and maintenance of vernal pools, native plant species, QCB focused planting areas, and artificial burrows.

After the installation contract is completed, the project proponent(s) would hire a maintenance contractor for the duration of the minimum 5-year monitoring period. The maintenance contractor and the installation contractor may be the same entity. The project proponent may change contractors at its discretion. The maintenance contractor will be educated as to the maintenance of native plant habitat and the difference between native plants and weeds. The maintenance contractor would service the entire restoration area at least once per month. Service would include, but not be limited to, weed control, trash removal, watering, fence repair, dead plant replacement, and re-seeding. If large scale trespassing occurs and the mitigation areas are destroyed by digging or otherwise reconfiguring the pools, mounds, or watersheds for the purposes of off-roading, dirt biking, or other unauthorized use, the mitigation area will be fully restored. All activities conducted would be seasonally appropriate and approved by the restoration specialist. The

maintenance contractor would meet the restoration specialist at the site when requested and would perform all checklist items in a timely manner, as directed by the project proponent.

5.4 RESTORATION IMPLEMENTATION SCHEDULE

5.4.1 Vernal Pool Restoration and Enhancement Implementation Schedule

The schedule for implementation of the mitigation program has not yet been set. Any implementation would only occur if weather and soil conditions are dry enough to conduct the vernal pool restoration without causing irreparable damage to the surrounding habitat. No activities would be conducted within the vernal pools unless approved by the Corps, USFWS, CDFG, and County. In order to obtain this approval, the following conditions must be met:

1. Grading will occur only when the soil is dry to the touch both at the surface and one inch below, and a visual check for color differences (i.e., darker soil indicating moisture) in the soil between the surface and one inch below indicates that the soil is dry.
2. After a rain of greater than 0.2 inch, grading will occur only after the soil surface has dried sufficiently, as described above, and no sooner than 2 days (48 hours) after the rain event ends.
3. Grading would commence only when no rain is forecast during the anticipated grading period.
4. To prevent erosion and siltation from stormwater runoff due to unexpected rains, Best Management Practices (i.e., silt fences and fiber rolls) would be implemented as needed during grading.
5. If rain occurs during grading, work would stop and only resume after soils are dry, as described above.

Initial vernal pool restoration and enhancement activities would include delineating all restoration areas, thatch removal from the entire site, impacting pool inoculum salvage, weed and trash removal, and vernal pool grading. Grading of the restored vernal pools would start once the site has been dethatched. Seeding and planting of the vernal pool enhancement areas would begin after it has been demonstrated that the pools are ponding and no additional contouring is needed. Inoculum will not be introduced into the restored pools until after they have been demonstrated to retain water for the appropriate amount of time to support San Diego fairy shrimp [i.e., at least 30 days (Hathaway and Simovich 1996, Ripley et. al. 2004)]. Inoculum will be placed in a manner that preserves, to the maximum extent possible, the orientation of the fairy shrimp cysts within the surface layer of soil (e.g., collected inoculum will be distributed within the pond so that cysts have the potential to be brought into solution upon inundation). The entire restoration, including pool and upland restoration and site dethatching, is anticipated to be complete within 4 weeks of starting. Pool grading cannot be conducted while the pool soils are wet or damp, so it is expected that pool grading could not be conducted before June or July of a given year. Site dethatching could also only be carried out when soils are dry and capable of

supporting machinery (usually June – November). Monitoring of the restoration effort would begin immediately following installation and will include quantitative hydrological monitoring; vegetation transects; viable cyst, hatched fairy shrimp, and gravid female measurements; complete floral and fauna inventories; and photographic documentation. The monitoring program would continue for a minimum 5-year period and until the success criteria are met and the resource agencies agree with the success of the site. Field surveys would be completed every other week during the rainy season and monthly during the dry season each year with an annual report being prepared and distributed by September 1. The results of the annual reports would be used to determine the success of the restoration effort and to determine any remedial actions necessary. When success criteria are achieved, a site visit will be offered to the resource agencies and a final report would be produced for agency review and approval. A general checklist showing the phases and responsible parties is included in Table 3.

Table 3
VERNAL POOL RESTORATION PLAN CHECKLIST

Construction Phase	Restoration Task	Applicable Parties				
		Project Proponent ¹	Grading Contractor	Installation Contractor	Maintenance Contractor	Restoration Specialist
Pre-construction	Order seed ¹			X		
	Attend pre-construction meeting	X	X	X		X
	Document pre-impact conditions, including a CRAM assessment					X
	Document pre-installation site conditions, including CRAM					X
	Salvage vernal pool topsoil			X		X ²
	Salvage rare plant seed					X
Installation	Delineate mitigation boundaries			X		X ²
	Remove non-native vegetation			X		X ²
	Restore vernal pool topography		X			X ²
	Install container stock and seed and replace vernal pool topsoil			X		X ²
	Conduct post-installation CRAM assessment					X
	Prepare/submit as-built report					X
Five-year Maintenance & Monitoring Period	Conduct maintenance monitoring and annual monitoring; Conduct Year 3 and Year 5 CRAM assessments					X
	Maintain site for remainder of 5 years - until signed off by resource agencies				X	X ²

¹ Must provide all source locations and receive authorization of final seed and plant lists prior to ordering

² Inspecting or overseeing work related to this task

5.4.2 Artificial Burrow Implementation Schedule

Implementation of the burrowing owl mitigation program will occur before any site grading is conducted provided that weather and soil conditions are dry enough to conduct the artificial burrow installation without causing irreparable damage to the mima mounds.

5.4.3 QCB Focused Planting Implementation schedule

Preparation of the QCB focused planting areas will occur concurrently with the vernal pool grading. Seeding of the QCB focused planting areas will occur in the late fall/early winter, concurrent with the seeding of the vernal pool restoration area.

5.4.4 Rare Plant Translocation Schedule

Variegated dudleya and San Diego barrel cactus would be salvaged before any project site grading occurs. Variegated dudleya salvage will occur in the fall, after the plants have gone dormant. Chocolate lily, spreading navarettia seed would be collected in the spring. San Diego button-celery seed would ideally be collected in July/August, as these are the most likely times of year for seed to still be on the plant. Efforts would be made to reduce the time between salvage and installation.

5.5 RESTORATION SITE PREPARATION

Site preparation would be accomplished by dethatching the non-native grasslands in the Lonestar Parcels, salvaging rare plants and seed in the proposed project site and seed on the mitigation site, grading restored vernal pools, compacting and preparing QCB focused planting areas, and protecting the restoration area from intrusion.

5.5.1 Initial Dethatching

The presence of a dense thatch of non-native grasses at this site impairs the emergence of native broadleaf species. Accumulation of years worth of dead grass stems (primarily wild oats [*Avena fatua*]) prevents the establishment and growth of native species throughout the site, including the pools and uplands. It is expected that the removal of grass thatch from the site will allow for the emergence of native species from the extant seed bank. All non-native grassland areas within the entirety of the Lonestar Parcels would be dethatched before any other restoration activities occur. Dethatching consists of mowing or weed-whipping standing grass stalks, and raking, collecting, and removing the grass straw and other cut weeds from the site. All cuttings and thatch would be disposed of in a legal manner. Prior to dethatching, areas supporting native plants would be flagged for avoidance.

5.5.2 Vernal Pool Inoculum Salvage

Restoration of the native vernal pool habitat on site requires the reintroduction of plants and animals, in addition to the physical construction described above. Partly because vernal pools recur reliably in the same location year after year, many vernal pool species are adapted for a

strategy of non-dispersal (Zedler 1990). As a result, the restoration of vernal pool habitat can be greatly accelerated by the active transport of propagules from donor sites into the restored pools (Scheidlinger et al. 1985). While only a small amount of vernal pool vegetation was observed in the existing pools on site, it is likely that vernal pool plant seed, spores, bulbs, cysts, and other propagules are present in the soil.

Prior to project site development, vernal pool topsoil would be collected, placed into boxes, and stored until the restoration site is ready. Hand tools (i.e., shovels and trowels and/or light machinery) would be used to remove the first one to 2 inches of soil from the existing pools. Soil would be placed in boxes of sturdy, moving grade cardboard, with lids. Typically the size of each box is 12 inches x 15 inches x 10 inches (depth). Butcher paper (or similar) will be placed in the bottom of the boxes to reduce leaks. Boxes should only be filled to 3/4 of capacity or approximately 3/4 cubic feet each, to allow for safe movement. The collected inoculum from each pool would be labeled and kept separate from inoculum collected from other pools. The amount of inoculum collected from a given pool depends upon its size, slopes, and quality. Each box must be labeled with the pool number, box number, and date of collection. Boxes would be moved to a secure, dry, enclosed storage facility. Boxes should be stored off the floor, on pallets or similar.

It is expected that topsoil salvage from the large pool on the east side of the site will include seeds of San Diego button-celery, spreading navarretia, and a considerable amount of weed seeds. Any restoration basin that receives topsoil from this basin would be closely observed for the emergence of Italian ryegrass (*Lolium multiflorum*).

Off-site inoculum would be required to supplement the salvaged soils to achieve reasonable vernal pool cover because of the low quality of the impacted pools. Potential sources of inoculum include other vernal pool restoration projects that have been conducted by HELIX on Otay Mesa, including the Caltrans SR-125 mitigation site, Robinhood Ridge Vernal Pool Preserve, Sweetwater Unified High School District Restoration Site, Cal Terraces, and Arnie's Point Vernal Pool Preserve. These locations provide a large surface area of pools, with a variety of vernal pool indicator plant species. Care would be taken to minimize the introduction of weed seeds into the restored vernal pools. Prior to the use of off-site inoculum, the restoration specialist would contact the appropriate resource agencies (Corps, USFWS, and CDFG) for approval. Inoculum will be collected in limited quantity, coordinated with the Service, from source pools, such that no appreciable damage occurs to source pools. No more than 10 percent of the basin area of any donor pool will be used for collection of inoculum.

5.5.3 Rare Plant and Seed Salvage

Variegated Dudleya

The large patches of variegated dudleya exist on the eastern side of the hill on the south edge of the project site. Seed and corms of these plants would be collected. Seed collection would be conducted by the restoration specialist or a qualified seed collector in June, and would attempt to collect as much seed as possible. Seed would be stored in a cool, dry,

dark, well ventilated location in paper bags until they can be placed in the receptor site. The seed collector would also gather seed of any chocolate lily observed.

Variegated dudleya would be salvaged and transplanted to receptor sites within the vernal pool restoration area (Figure 4) in the summer/fall when the plants are dormant. At this time of year the above ground portion of the plant has died off, leaving an underground corm to resprout in the following winter/spring season. Salvage of the corms will be accomplished by collecting large chunks of soil several inches deep and approximately one foot in diameter from the impacted population areas. The corm containing soil chunks will be carefully removed with hand tools so that the corms and topsoil remain undamaged. By collecting and transplanting chunks of soil, instead of digging up individual corms, the corms will remain at their original depth and position in the soil. In addition, the chunks contain corms, bulbs, seed, and propagules of other desirable native species. Following collection, the soil clumps will be placed in nursery flats and carefully transported to the receptor site for transplantation.

San Diego Barrel Cactus

When salvaging the San Diego barrel cactus, the contractor will mark the south side of the cactus with a small amount of paint. The main taproot should be trimmed to approximately 6 inches, laid in shade, and kept dry for a week to allow the root to callus over. Roots may also be dusted with sulfur at time of removal to prevent rot. Plants should be kept in a holding bed or pot, of native soil mixed with sand. When the cactus is installed at the planting site, the cactus should be oriented with the marked side facing south, to prevent sun damage to the plant. Cactus should ideally not be held for more than 6 months, to prevent the cactus from rooting at the holding site.

San Diego Button Celery and Spreading Navaretia

Introduction of San Diego button celery and spreading navaretia into the restored pools will be coordinated with the Service. Spreading navaretia seed obtained for restoration purposes will be collected using the below guidelines: No more than 5 percent of the projected annual seed production of any individual plant or discrete population of plants should be collected; collections will be made in such a manner to capture the majority of the genetic variation found in the sampled populations; and the seed will be collected from the site closest to the habitat restoration/creation site where access can be obtained.

5.5.4 Vernal Pool Grading

The restored pools (Figures 3 and 4) would be formed to replicate hydrologic conditions of existing vernal pool habitat in Otay Mesa. A post-construction hydrologic analysis depicts the vernal pool restoration area and its watershed following project implementation and vernal pool restoration (Figure 5). Pools would be graded to have maximum depths of 4 to 6 inches for San Diego fairy shrimp pools and 12-24 inches for Riverside fairy shrimp pools, with the goal of having appropriate ponding for these species. Pools are planned to have slopes of 12:1 to 15:1 to provide smooth, micro-topographic variance for vernal pool plants. Material removed during pool excavation would be used to enhance and restore existing disturbed mima mounds. All restored pools would be created and inoculated with appropriate vernal pool flora and fauna.

Vernal pool grading would be carried out under the supervision of the restoration specialist. The restoration specialist would mark all areas to be graded. Existing sensitive habitats and plants would be marked as avoidance areas. Access routes would be identified and marked. No access would occur through the adjacent Caltrans preserve. An on-site meeting would be held with the restoration specialist and all installation personnel to identify sensitive areas and devise a strategy for avoidance prior to initiation of restoration activities. A staging area would be established outside of the on-site vernal pool restoration area. Grading shall be implemented using rubber-tired loaders with ripping tines and slope boards. Skid-steer loaders would not be used because of their high impact on soil. All vehicles and construction equipment would be restricted to the staging areas when not required for restoration activities.

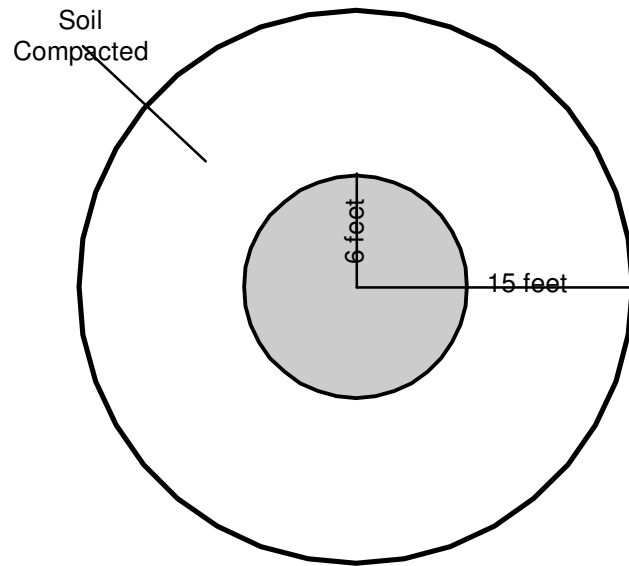
5.5.5 QCB Habitat Focused Planting Area Compaction

While compact, undisturbed clay soils may support habitat suitable for QCB, disturbed native topsoils are subject to high rates of colonization by non-native grasses and other tenacious weeds. QCB habitat focused planting areas are designed to have compact soils that retard the invasion of weeds and allow for QCB basking areas, and are heavily seeded to have large amounts of QCB host and nectar plants. These areas are intended to provide immediate QCB habitat while the other enhancement and restoration activities are expected to take 5 or more years to become fully established. Over time the focused QCB areas may revert to non-native grassland, similar to the surrounding habitat. It is anticipated that the need for the focused QCB areas in the future will be lessened with the successful completion of the adjacent enhancement and restoration effort,

Six focused QCB habitat focused planting areas would be constructed in the vernal pool restoration area (Figure 6). Each QCB habitat area would be 30 feet in diameter (707 square feet) and would be centered on a mima mound. Construction would involve removing all weed material, ripping the soil surface, importing decomposed granite, spreading the gravel over the planting area, and compacting it into the soil surface. Soil would be ripped to a depth of 4-inches with ripping tines mounted to a tractor. Approximately one cubic yard of decomposed granite would be imported per area (6 yd³ total). The granite gravel would be spread over each QCB area and compacted into the soil by driving a wheeled or tracked tractor over it.

HELIX constructed 6 of these focused planting areas for the Redhawk mitigation site in the City of Murrieta, California. The Redhawk mitigation site experienced similar levels of grazing and non-native grass invasion as the Lonestar Parcels. At the end of the fourth year of monitoring program, the focused planting areas remained low in weed cover and had high cover of QCB host plants (HELIX 2006). Over time non-native grassland has encroached into the QCB areas; however, the adjacent restored sage scrub has become more established with QCB host plants as a recurring component and therefore the need for the focused QCB areas is lessened. Similar success with this procedure is anticipated at this location.

Planting Diagram for Each Focused Quino Checkerspot Butterfly Seeding Area (6 Total)



Center Circle

2 Lbs Dot-seed plantain (*Plantago erecta*) - Quino host plant

Outer Circle

0.2 Lb Coulter's snapdragon (*Antirrhinum coulterianum*) - Quino host plant

0.4 Lb Rancher's fiddleneck (*Amsinckia menziesii* var. *intermedia*) - Quino nectar resource

0.2 Lb Purple owl's clover (*Castilleja exserta* ssp. *exserta*) - Quino host plant

0.2 Lb Chinese houses (*Collinsia heterophylla*) - Quino host plant

0.2 Lb Nievitas cryptantha (*Cyrtanthera intermedia*) - Quino nectar resource

0.4 Lb Common goldfields (*Lasthenia gracilis* (L. *californica*)) - Quino nectar resource

0.2 Lb Ground Pink (*Linanthus dianthiflorus*) - Quino nectar resource

3 Lbs Dot-seed plantain (*Plantago erecta*) - Quino host plant

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Focused Quino Checkerspot Butterfly Habitat Seeding Area Diagram

VERNAL POOL PRESERVE RESTORATION PLAN FOR OTAY BUSINESS PARK

5.5.6 Fencing and Signage

A temporary, non-barbed, 3-wire fence would be constructed around the boundary of the 4.7-acre vernal pool restoration area to delineate this area for maintenance activities, and would tie into the existing fence along the adjacent preserve.

Aluminum signs would be posted adjacent to the dirt road on the north and south boundary of the site, providing notice in both English and Spanish that the area is an ecological preserve and that trespassing is prohibited.

5.6 ARTIFICIAL BURROW INSTALLATION

Thirty-five artificial burrows would be constructed of man-made materials and installed on the Lonestar Parcels. The burrow locations would be situated on mima mounds to ensure a slightly higher vantage point on the surrounding area. The area immediately adjacent to the artificial burrows would be cleared of vegetation, compacted, and covered with several mid-size rocks to discourage the establishment of tall vegetation.

The artificial owl burrow design (Figure 7) is based on plans described in the CDFG staff recommendations (CDFG 1995) and in Barclay (2008). Each artificial owl burrow would consist of a nest chamber and 2 entrance/exits. An irrigation valve box is used as the nest chamber and would be placed at least a foot underground. The valve box would be covered by chicken wire mesh fencing to discourage predation. Bricks would be placed below each box, with 3 to 4 inches of soil on top of the bricks, to create a dirt floor within the chamber. The 2 entrance/exits would be created using 4-inch corrugated black drain pipes. Each pipe would have a 90 degree bend to keep light out of the nesting chamber. The pipes will be installed at a slight downward angle to prohibit water flow into the nesting chamber. To prevent animals from digging into the burrows, chicken wire would be placed on top of the chamber and the pipes and then would be buried with soil. The ends of the pipes would pass through square cinder blocks to help prevent the pipes being dug up or crushed. A stake/post would be provided adjacent to each artificial burrow to provide a perch. Any rocks unearthed during burrow construction would be piled on the soil surface above the nest box. A native seed mix would be applied to any soil disturbed during the creation of the artificial owl burrows (Table 4). This mix includes QCB host and nectar plant species to help improve the overall habitat for this species.

Table 4
ARTIFICIAL OWL BURROW HABITAT SEED MIX

Scientific Name	Common Name	Pound/Acre	Amount to be Ordered*
<i>Calochortus splendens</i>	splendid mariposa lily	1	0.5
<i>Castilleja exserta</i> ssp. <i>exserta</i>	purple owl's clover	2	1
<i>Cryptantha intermedia</i>	nievitas cryptantha	1	0.5
<i>Eschscholzia californica</i>	California poppy	2	1

Table 4 (cont.) ARTIFICIAL OWL BURROW HABITAT SEED MIX			
Scientific Name	Common Name	Pound/Acre	Amount to be Ordered*
<i>Lasthenia gracilis</i> (<i>L. californica</i>)	common goldfields	3	1.5
<i>Lepidium nitidum</i>	shining peppergrass	2	1
<i>Nassella pulchra</i>	purple needlegrass	4	2
<i>Plantago erecta</i>	dot-seed plantain	2	1
<i>Sisyrinchium bellum</i>	blue-eyed grass	2	1
TOTAL		19	9.5

*Based on one-half acre

5.7 VERNAL POOL RESTORATION AREA PLANTING PLAN/ INSTALLATION

5.7.1 Vernal Pool Inoculation

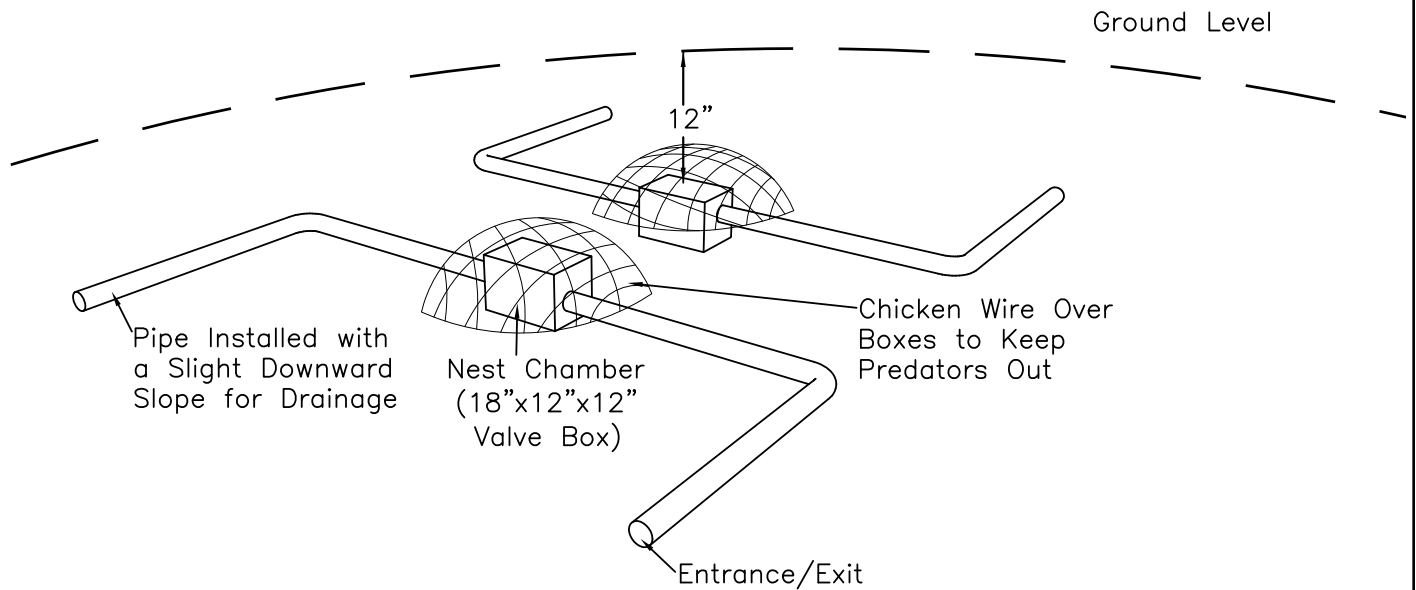
After the pools are successfully graded and have demonstrated adequate ponding, each of the restored pools would receive a share of the total collected pool material proportionate to its surface area. The collected soils would be spread out and raked into the bottoms of the restored pools.

5.7.2 Vernal Pool Restoration Area Planting Plan

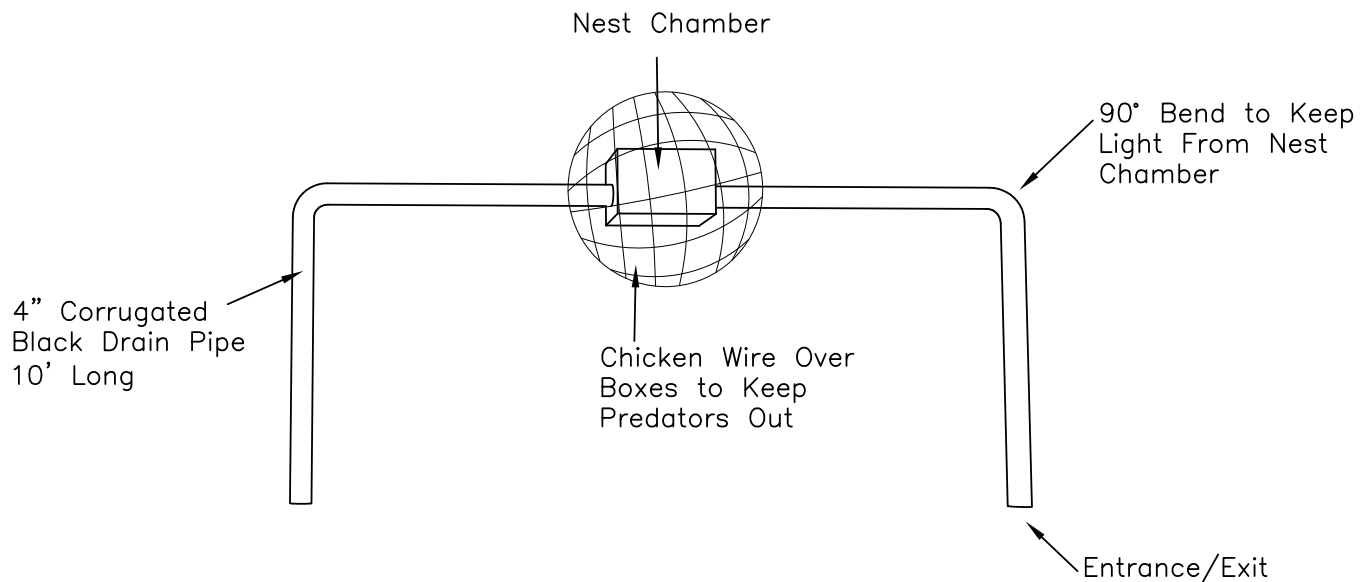
Restoration of upland habitat is critical to the overall success of this vernal pool restoration plan. Without native vegetative cover to prevent erosion, the pools may fill with materials washed in from the adjacent upland areas or become overrun by annual grass weeds. All vernal pool restoration will occur within a 4.70-acre portion of the site. Uplands in this restoration area will be restored to either native grassland or Diegan coastal sage scrub. Upland restoration will involve a number of techniques including installing: (1) salvaged rare plants from the Otay Business Park site, (2) container stock plantings, and (3) commercially obtained seed mix. No seeding or planting will occur within restored pools (besides salvaged inoculum).

Native grassland restoration will occur in 0.38 acre of the vernal pool uplands. The remainder of the upland restoration will consist of the addition of supplemental Diegan coastal sage scrub species. The planting palette for the native grassland is presented in Table 5. All grass plantings would be 2-inch “square-liner” plugs. The native grassland seed mix is presented in Table 6. The seed mix is dominated by native bunchgrasses, with additional forb and shrub species. All seed will be broadcast by hand. To take advantage of the rainy season and minimize seed predation, all seeding will occur between November 15 and January 15.

Artificial Burrowing Owl Burrows Side View



Artificial Burrowing Owl Burrows Top View



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Artificial Burrowing Owl Burrows

VERNAL POOL PRESERVE RESTORATION PLAN FOR OTAY BUSINESS PARK

Table 5 NATIVE GRASSLAND PLANT PALETTE			
Scientific Name	Common Name	Number per Acre	Number to be Ordered*
<i>Nassella lepida</i>	valley needlegrass	500	190
<i>Nassella pulchra</i>	purple needlegrass	1500	570
TOTAL		2000	760

*Based on 0.38 acre

Table 6 NATIVE GRASSLAND SEED MIX			
Scientific Name	Common Name	Pounds per Acre	Amount to be Ordered*
<i>Achillea millefolium</i>	yarrow	1	0.38
<i>Aristida purpurea</i>	purple three-awn	1	0.38
<i>Artemisia californica</i>	coastal sagebrush	2	0.76
<i>Eriophyllum confertiflorum</i>	golden yarrow	2	0.76
<i>Eriogonum fasciculatum</i>	California buckwheat	3	1.14
<i>Lupinus bicolor</i>	bicolor lupine	1	0.38
<i>Melica imperfecta</i>	oniongrass	1	0.38
<i>Nassella lepida</i>	valley needlegrass	2	0.76
<i>Nassella pulchra</i>	purple needlegrass	5	1.9
<i>Sisyrinchium bellum</i>	blue-eyed grass	1	0.38
<i>Viguiera laciniata</i>	San Diego sunflower	1	0.38
TOTAL		20	7.60

*Based on 0.38 acre

The Diegan coastal sage scrub container stock plant palette is included in Table 7. The amount of container stock for each species is dependent upon availability from local nurseries. All of the species in the planting and seeding palettes have been observed either on the Lonestar parcels or on south facing slopes in the vicinity of Otay Mesa. All sage scrub plantings would be one-gallon pots. Root bound container stock would not be accepted from the nursery. Container stock placement would be overseen by the restoration specialist, and plants would be positioned prior to planting. Planting holes should be excavated to 1.5 times the planting depth, to loosen the soil. Prior to installing container stock, the planting hole would be filled with water and allowed to drain, to build soil moisture. Container stock should be planted so that after soil settling, the crown of the root ball is one-inch above finish grade. The holes should be backfilled around the container stock with native soil, and the holes would be watered immediately after planting, to settle the soil. Any voids or settlement should be filled with additional native soil, and the watering repeated.

Table 7 DIEGAN COASTAL SAGE SCRUB CONTAINER STOCK PLANT PALETTE			
Scientific Name	Common Name	Number per Acre	Number to be Ordered*
<i>Adolphia californica</i>	spineshrub	40	132
<i>Ambrosia chenopodiifolia</i>	San Diego bur-sage	20	66
<i>Artemisia californica</i>	coastal sagebrush	150	495
<i>Brickellia californica</i>	California bricklebrush	20	66
<i>Cylindropuntia californica</i> var. <i>californica</i>	snake cholla	20	66
<i>Cylindropuntia prolifera</i>	coast cholla	N/A	100†
<i>Eriogonum fasciculatum</i>	California buckwheat	200	660
<i>Ferocactus viridescens</i>	San Diego barrel cactus	20	66
<i>Malacothamnus fasciculatus</i>	bush mallow	20	66
<i>Mirabilis laevis</i>	wishbone bush	20	66
<i>Opuntia littoralis</i>	coast prickly-pear	N/A	100†
<i>Viguiera laciniata</i>	San Diego sunflower	200	660
TOTAL		710	2,543

*Based on 3.3 acres

†For use in coastal cactus wren planting areas, away from owl burrows

The seed mix for the upland restoration area is presented in Table 8. This palette includes a mix of shrub, forb, and native bunchgrass species. To take advantage of the rainy season and minimize seed predation, all seeding will occur between November 15 and January 15.

Table 8 DIEGAN COASTAL SAGE SCRUB SEED MIX		
Scientific Name	Common Name	Amount (lbs) to be Ordered*
<i>Achillea millefolium</i>	yarrow	4
<i>Artemisia californica</i>	California sage brush	12
<i>Bloomeria crocea</i>	common golden star	4
<i>Convolvulus simulans</i>	small-flower morning glory	2
<i>Corethrogyne filaginifolia</i> var. <i>filaginifolia</i>	common sand-aster	4
<i>Dichelostemma capitatum</i>	blue dicks	4
<i>Dodecatheon clevelandii</i> †	shooting stars	4
<i>Eriogonum fasciculatum</i>	California buckwheat	20
<i>Eriophyllum confertiflorum</i>	golden yarrow	8
<i>Eschscholzia californica</i>	California poppy	4
<i>Lotus scoparius</i>	deerweed	12
<i>Nassella pulchra</i>	purple needlegrass	16

Table 8 (cont.) DIEGAN COASTAL SAGE SCRUB SEED MIX		
Scientific Name	Common Name	Amount to be Ordered*
<i>Penstemon spectabilis</i>	showy penstemon	2
<i>Plantago erecta</i>	dot-seed plantain	8
<i>Sisyrinchium bellum</i>	blue-eyed grass	8
<i>Viguiera laciniata</i>	San Diego sunflower	16
TOTAL		128

*Based on 3.8 acres

‡These species will be kept separate from the rest of the seed order, and applied on the north facing sides of existing mima mounds

5.7.3 QCB Focused Planting Area Planting Plan

QCB habitat focused planting areas will be hand-seeded with a mix of larval host plants and potential nectaring resource flowers at the beginning of the rainy season (Table 9). The inner area, in a 6-foot radius from the center of the planting area, will be seeded with a high concentration of dot-seed plantain, a main QCB larval host plant. An outer ring, consisting of the area from 6 through 15 feet from the center of the circle, will be seeded with a mix of QCB larval and host plants (Figure 6).

Table 9 QCB HABITAT FOCUSED PLANTING AREA SEED MIX			
Scientific Name	Common Name	Pound/ Area†	Pounds to be Ordered
Center Seeding Area			
<i>Plantago erecta</i>	dot-seed plantain	2.0	12.0*
Outer Seeding Area			
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	rancher's fiddleneck	0.4	2.4
<i>Castilleja exserta</i> ssp. <i>exserta</i>	purple owl's clover	0.2	1.2
<i>Cryptantha intermedia</i>	nievitas cryptantha	0.4	2.4
<i>Lasthenia gracilis</i> (<i>L. californica</i>)	common goldfields	0.4	2.4
<i>Linanthus dianthiflorus</i>	ground pink	0.4	2.4
<i>Plantago erecta</i> **	dot-seed plantain	3.0	18.0
TOTAL		6.8	40.8*

†Seeding rates are dependent on availability of seed material

*Center circle seed to be kept separate from rest of order

** Preferred source from more prostrate, non-fuzzy populations on Otay Mesa

Flat-top buckwheat (*Eriogonum fasciculatum*) shrubs (Table 7) will be installed around the perimeter of each focused QCB habitat focused planting area to provide needed shrub cover for any QCB utilizing the area. Some of the cobble expected to be uncovered during vernal pool grading and container stock planting would be placed in the QCB habitat focused planting areas to provide basking perches for QCB.

5.7.4 Rare Plant Translocation

The receptor sites for the variegated dudleya are located in mima mounds adjacent to vernal pools near areas supporting existing variegated dudleya populations. Soil at the receptor sites will be loosened to a depth of approximately 4 inches prior to planting with the collected soil clumps. The soil clumps will be hand “tiled” in the ripped area in much the same way kitchen tiles are fitted on to a counter top. Each clump will be carefully placed in the soil such that the surface of the clump is level with the surrounding ground level and there are no spaces between adjacent clumps. Careful placement and fitting will continue until all of the clumps have been planted. At this time, the entire area will be watered to help the clumps settle into place. Native topsoil will be used to fill in any gaps that open up after watering. Collected variegated dudleya seed will be applied to the vicinity of the dudleya clumps at the beginning of the rainy season. Once the clump fitting and site seeding is complete, the entire area will be marked, staked, and flagged to preclude accidental entry and to identify the area in the future.

Salvaged San Diego barrel cactus will be planted in groups throughout the vernal pool restoration area. Groupings will consist of at least 5 plants. The cactus will be aligned with the previously applied mark pointing south. Metal plant tags will be installed in the soil near transplanted San Diego barrel cactus, so that the transplanted individuals can be differentiated from the container stock plantings after the paint markings fade.

5.8 IRRIGATION PLAN

No broadcast irrigation is planned or considered appropriate for this project. Runoff from any spray irrigation could alter the hydrology or water chemistry of the surrounding vernal pools. Irrigation runoff entering pools could cause vernal pool plant seed germination or fairy shrimp cysts to leave diapause at a time of year not appropriate, and therefore cause the death of these individuals.

Any artificial watering of the restored pool watersheds will be done in a manner that prevents water from entering into the pools. Any water to be used will be identified and documented to be free of contaminants that could harm the pools.

Container stock and grass plugs will be watered in at the time of planting, and then periodically during the installation and maintenance period. A water truck will be brought to the site, and water will be moved to the container stock by hose or watering can. The water truck will remain on designated roads, and will not enter the restoration sites. Each planting will be individually watered by hand, in a way such that run-off from the planting does not occur. During installation, the entire planting hole will be watered, but afterwards, only the deep pipe will be watered. During each watering visit, each deep pipe will be filled, allowed to naturally drain, and then filled again.

5.9 WILDLIFE HABITAT ENHANCEMENT

In addition to seeding and planting, the restoration effort will include additional measures intended to increase the potential for wildlife usage of the site, particularly in the early years prior to full establishment.

5.9.1 Small Animal Cover

In order to encourage wildlife establishment and use of the restoration area, and document small animal presence, shelter for small mammal and reptile species will be created on site. These shelters include placement of 20 half-inch thick plywood boards, measuring 2 by 4 feet, within the site. These boards will provide shade, cover, and nesting locations for species including mice, lizards, snakes, and numerous invertebrate species (insects, spiders, etc.). The boards also provide an opportunity to monitor the wildlife usage of the site. During regular monitoring visits, the project biologist will be able to lift each board and note the species present.

Additionally, the sparse shrubs on the hill on the southern side of the Otay Business Park will be collected and used for brush piles within the Otay Business Park Mitigation site. Shrubs will be collected by hand before site grading, transferred to the restoration site, and stacked into low brush piles to provide additional cover for small animals.

5.9.2 Pollinator Support

Pollinator species are integral in a diverse, self sustaining habitat. Pollinators may include bats, birds, and a host of insects. The restoration seed mixes include a variety of forbs and other plants with overlapping flowering periods to support a wide-range of pollinators that will stimulate continued seed production and provide pollen and nectar sources for foraging wildlife. In addition, 20 bee blocks will be prepared and scattered throughout the Lonestar Parcels to provide nesting locations for native wood and cavity-nesting bees. Bee species from the Apidae, Colletidae, Halictidae, and Megachilidae families are expected. The bee blocks will consist of an untreated 4 inch by 8 inch by 12 inch block of wood. Numerous holes ranging in size from 3/32 inch to 3/8 inch in diameter will be drilled approximately 3/4 inch on center on the 4-inch wide face of the block. The hole depths will be approximately 3 to 4 inches for holes less than 1/4 inch in diameter and 5 to 6 inches for holes greater than 1/4 inch in diameter. The varying hole sizes and depths should attract a variety of native solitary bee species. The bee blocks will be positioned such that they face the morning sun (east to southeast).

The restoration effort also will include support for ground-nesting bees in the form of small, shallow sand pits (Sarver 2007). A total of 12 sand pits will be installed within the Lonestar parcel, with at least 4 of those within the vernal pool restoration area. Each pit will be approximately 2 feet deep and 4 feet in diameter. The pits will be filled with a mix of sand, native soil, and organic material (plant chippings). In addition to ground nesting bees, several other insect species may use these pits as foraging and nesting areas. Birds also may use the pits for taking dust baths for feather maintenance, parasite control, and temperature regulation.

5.9.3 Cactus Wren Habitat

Populations of coastal cactus wrens have dramatically decreased over recent years due to habitat loss resulting from wildfires and development. Coastal cactus wren is a California Species of Special Concern and is known to inhabit communities of coastal sage scrub that contain substantial clusters of cactus species. The species nests almost exclusively in cholla and prickly pear species. Coastal cactus wren was observed in nearby Johnson Canyon in 2010 by HELIX biologists. Prickly pear (*Opuntia littoralis*) and coast cholla (*Cylindropuntia prolifera*) container stock will be planted in thick patches within the restoration area to provide habitat suitable for cactus wren nesting (Table 7). Patches will contain at least 20 plantings. Cholla will not be planted in the vicinity of artificial owl burrows to reduce the possibility of desert woodrat (*Neotoma lepida*) from using the artificial burrows in conjunction with these cacti.

5.9.4 San Diego Fairy Shrimp

The majority of the Lonestar mitigation site is within designated Critical Habitat for the San Diego fairy shrimp. The habitat restoration effort is intended to improve the quality of the habitat for this, and other vernal pool associated species, through vernal pool habitat restoration and enhancement of the primary constituent elements (PCEs) of San Diego fairy shrimp habitat. PCEs for this species include:

1. Vernal pools with shallow to moderate depths (2 in [5 cm] to 12 in [30 cm]) that hold water for sufficient lengths of time (7 to 60 days) necessary for incubation, maturation, and reproduction of the San Diego fairy shrimp, in all but the driest years;
2. Topographic features characterized by mounds, swales, and depressions within a matrix of surrounding uplands that result in complexes of continuously, or intermittently, flowing surface water in the swales connecting the pools described in PCE 1, providing for dispersal and promoting hydro periods of adequate length in the pools (i.e., the vernal pool watershed); and
3. Flat to gently sloping topography, and any soil type with a clay component and/or an impermeable surface or subsurface layer known to support vernal pool habitat (including Carlsbad, Chesterton, Diablo, Huerhuero, Linne, Olivenhain, Placentia, Redding, and Stockpen soils).

All of these PCEs occur within the restoration site. The habitat restoration activities proposed in this plan will improve and increase the presence of PCEs no. 1 and 2 noted above. Specifically, the project will increase the amount of vernal pools supporting San Diego fairy shrimp on site from 2 pools (0.01 acre) to as many as 50 restored pools (0.36 acre), a 3,600 percent increase in known occupied pool area for the Lonestar CH subunit. Additionally, the mowing of grasses and thatch removal across the site (refer to Section 5.5.1), and within the preserved vernal pools, will improve the quality of the existing vernal pool and San Diego fairy shrimp habitat on site. Over the past several years, since the removal of cattle on the site, non-native grasses (primarily *Avena* spp. and *Lolium multiflorum*) have steadily taken hold within the pools, altering their hydrological characteristics and reducing their ability to pond water long enough and deep enough for San Diego fairy shrimp populations to persist. Mowing and thatch removal is

expected to result in increased capacity for a total of 80 existing pools to support fairy shrimp over time by decreasing the amount of non-native grasses that occur within and adjacent to the pools. By reducing the amount of grasses from within and adjacent to the pools, it is anticipated that their water holding characteristics will improve (increased duration and depth), which should result in better fairy shrimp habitat.

5.10 HABITAT AND ARTIFICIAL BURROW AS-BUILT CONDITIONS

The restoration specialist shall submit to the County, Corps, CDFG, and USFWS, within 6 weeks of completion of site preparation and planting, a map showing the as-built conditions of the vernal pool mitigation areas. Areas of grading and seeding shall be shown on the map. The restoration specialist shall submit to the County, USFWS, and CDFG within 6 weeks of completion of installation of artificial burrows and planting, a map showing the as-built conditions of the artificial burrows.

6.0 MAINTENANCE PLAN

6.1 HABITAT MAINTENANCE ACTIVITIES

A 5-year maintenance program is proposed to ensure the successful establishment and persistence of the restored habitat. The maintenance program would involve removal of trash, weed control, fence repair, and any remedial measures deemed necessary for restoration program success (e.g., re-seeding and re-contouring). Long-term management would be conducted according to the Resource Management Plan for Otay Business Park Off-Site Biological Open Space at Lonestar Ridge (HELIX 2011b).

6.1.1 Trash Removal

The maintenance contractor would remove any trash encountered within the Lonestar Parcels during every maintenance event and dispose of it in a legally acceptable fashion.

6.1.2 Weed Control

Vernal Pool Restoration Area

Particular maintenance emphasis in the vernal pool restoration area will be placed on pro-active weed control. All weed species observed within the vernal pool restoration area during restoration activities would be considered invasive and targeted for removal. All workers conducting weed removal activities would be educated to distinguish between native and non-native species, with special attention paid to rare and endangered plant species. All weeding within the restored pools would be performed by hand and with hand tools. Care would be taken within pools to avoid removing vernal pool plant species and to reduce soil disturbance. Weeds would be removed from the restoration limits and disposed of in a legal manner. All weeds would be removed prior to reaching 12 inches in height or before reaching seed. Leaf and branch drop of native species should be left in place and not removed from the site.

Weeds in the uplands of the vernal pool restoration area will be removed by hand tools whenever possible, but focused herbicide application could be used if needed and requested by the vernal pool restoration specialist. Pesticides would only be applied by workers licensed to use those chemicals.

Additionally, no herbicide will be used within 5 feet of any vernal pools. Herbicides will not be used during wet or windy conditions. Care will be taken not to saturate the soils with herbicide, and any herbicide used will not be allowed to be blown into pools.

In an effort to reduce damage to small annual plants and to avoid walking on QCB larval host plants (e.g. dot-seed plantain and purple owl's clover [*Castilleja exserta*]), care will be taken in the QCB habitat focused planting area.

Mechanical removal of weed species with a line trimmer or other such device in the upland areas also may be necessary. However, no mechanical weed removal devices will be used in any pool. Weeding will not occur in inundated sections of the pools. Pools may be recontoured if necessary to increase the hydrologic ponding period, which helps exclude upland weed species.

As the southern california region is already polluted with nitrogen deposition, no fertilizers will be used in the restoration site.

Vernal Pool Watershed Enhancement Area

The entire non-native grassland area of the Lonestar Parcels would be dethatched during initial site preparation and additional times during the maintenance period. Additional mechanical or chemical control of weeds within the entire non-native grassland area will occur in February of each year of the 5-year monitoring period. Weeding must be completed by the maintenance contractor in February, before annual grasses go to seed, to reduce the seedbank of these weeds and prevent the formation of new straw thatch. Conducting grass removal during this time also will help to avoid inadvertently removing native annual species that emerge and flower in the spring. In addition, the restoration specialist will flag avoidance areas to help maintenance crews avoid native species.

6.1.3 Artificial Burrow Maintenance

Maintenance personnel shall be educated as to the sensitivity of burrowing owls and the goals of the artificial burrow maintenance program. Maintenance tasks shall be performed only at the direction of the specialist for a 5-year period following burrow construction. Sites have been selected and designed to ensure that the need for maintenance would decrease each of the 5 years. The specialist may direct maintenance personnel to avoid burrows by providing a minimum 50-meter (m), non-maintenance buffer should owls occupy burrows.

Maintenance tasks could include vegetation management around each burrow, repair of burrows damaged by vandalism, and installation of signs prohibiting trespassing in sensitive habitat areas (i.e., where burrows are located).

Vegetation management could include mowing or weed-whipping a 50-foot radius around each burrow, although the burrow locations have been designed with gravel placement, soil compaction, and seeding with low-growing plant species to limit the need for this type of maintenance. Vegetation management could also include reseeding around the burrows with the low-growing plant species listed earlier in this document, or other species, if deemed necessary by the specialist. Damage to burrows could be caused accidentally (such as by maintenance equipment or humans trespassing) or by vandalism. Damage could include collapse or blockage of burrow entrances or vegetation alteration around burrows. Damaged burrows and vegetation surrounding the burrows should be repaired to their pre-damaged condition within one week of the damage being observed. In a worst-case scenario, damage repair could include reconstructing part of a burrow, recompacting soil, and reseeding. The burrows would be designed and installed to limit the potential risk of collapse by making use of heavy materials and extending the burrow entrances well beyond the soil horizon.

The restoration specialist will be periodically inspecting the artificial burrows for presence of burrowing owls (See section 8.1.3). If owls are observed, the restoration specialist will determine if maintenance adjacent to the burrows can be avoided. Maintenance adjacent to burrows will only be a priority in February to March, when exotic plants tend to exhibit the most growth. Maintenance in the vicinity of active burrows will be avoided during the burrowing owl breeding season (April 15 through July 15). The restoration specialist will provide a labeled map to the maintenance personnel showing the location of any avoidance areas.

6.1.4 Container Stock Irrigation

Container stock, native grass plugs, and transplanted sensitive plants will be hand watered at least twice a month, if necessary, during the first 2 years of maintenance and monitoring. Hand watering may not be necessary during the rainy months. Water will be applied in such a way that run off does not occur.

Dead container stock will be replaced by the maintenance contractor at the request of the vernal pool restoration specialist, if container stock are not meeting survival goals.

6.1.5 Fence Repair

The 3-strand barbless wire fence will be maintained in good order by the maintenance contractor. The maintenance of the existing chain-link fence bordering SR-125 is not the responsibility of the maintenance contractor.

6.2 HABITAT MAINTENANCE SCHEDULE

Regular maintenance, trash removal, and weed control of the vernal pool restoration area would be conducted during the first 5 years following implementation of the mitigation program or until the mitigation program is deemed successful. Maintenance personnel would visit the site at least monthly for the 5-year maintenance and monitoring period. Additional visits would be conducted as directed by the restoration specialist during the rainy season (generally December through May) each year to keep weeds under control.

7.0 SUCCESS CRITERIA

As discussed in Section 3.0, mitigation for impacts to 0.24 acre of vernal and road pools with and without fairy shrimp would be at a 5:1 ratio, and would consist of 1.14 acres of vernal pool restoration and preservation, and watershed enhancement of preserved pools. The loss of 114.4 acres of designated critical habitat with limited PCEs for San Diego fairy shrimp will be offset through the conservation and enhancement of the PCEs within 62.2 acres of critical habitat and 1.3 acres of essential habitat at the Lonestar Parcels. Impacts to rare plant species would be met through translocation of impacted populations from the Otay Business park site, and preservation of existing rare plant populations at the Lonestar Parcels. Impacts to owl burrows and occupied burrowing owl habitat would be met with the installation of 35 artificial burrows and the preservation of habitat.

The following sections provide performance standards to determine the successful completion of the 5-year mitigation and monitoring program. Attainment of these standards indicates the mitigation areas are progressing toward the habitat functions and services specified for this plan. Methods used to measure these success criteria are described in the following text. If the restored areas fail to meet the Year 5 standards after the full monitoring term, a specific set of remedial measures (approved by the CDFG, Corps, USFWS, and County) would be implemented, and the monitoring and maintenance period would be extended until all Year 5 standards are met or as otherwise provided in this document. Only areas failing to meet the success standards would require additional work (i.e., not all of the areas originally restored), and only when the entire mitigation site is meeting the Year 5 standards will the entire site be signed off.

7.1 RESTORED VERNAL POOLS

7.1.1 Control Pools

In order to measure the success of the restored vernal pools, up to 19 off-site preserved pools in Otay Mesa would serve as control pools. These control pools are separate from the pools selected for the CRAM analysis. The selected off-site pools are the same as those being used for the adjacent Caltrans SR-125 vernal pool restoration effort. Data collection in the pools will be coordinated between the different projects such that methods are the same and impacts to pools caused by monitoring will be minimized. Seven of the pools are located within the J-23 complex (Bauder 1986) adjacent to Johnson Canyon approximately 3,000 feet northeast of the restoration site. Vernal pool plant indicator species and native vernal pool associated species observed in the off-site control pools are presented in Table 10.

An additional 12 potential control pools are located 2 miles east of the Lonestar Parcels on the Upham Parcel. This parcel was previously being managed as a habitat preserve by The Environmental Trust. The pools on this site are within the J-26 complex. While not being actively managed, the J-26 pools are protected from grazing and off-highway vehicle (OHV) impacts by a barbed wire fence, making it a reliable control site. There have been some instances of disturbance in this area, including flooding from an adjacent broken pipeline. Only

non-disturbed pools within this complex will be used as control pools. Pools that become damaged or disturbed during the monitoring period will be removed from the list of control pools

In addition to the off-site pools, 2 of the on-site preserved pools will be selected as control pools during the first year annual monitoring event. The on-site control pools are scattered throughout the extant mima-mound topography of the Lonestar Parcels. The control pools will be of similar depth and vegetative makeup as those proposed for the mitigation site.

Success of the restored vernal pools would be determined by comparing species richness and vegetative cover with the control pools. A transect/quadrat sampling method would be used to monitor the restored pools (described in Section 8.1). The methods will be coordinated each year with other projects using the same control pools such that the methods and data collected will be compatible. Permanent transects and decimeter quadrats have been established within the off-site control pools and would be established in the on-site control pools and the restored pools. Each year, species richness and vegetative cover within the quadrats would be measured and recorded. This data would be used to determine if the restored pools have met the success criteria described below.

Table 10	
CONTROL POOL VERNAL POOL PLANT SPECIES	
SCIENTIFIC NAME	COMMON NAME
Vernal Pool Indicators*	
<i>Callitriche marginata</i>	long-stalk water-starwort
<i>Centunculus minimus</i>	chaffweed
<i>Crassula aquatica</i>	dwarf pygmyweed
<i>Deschampsia danthonoides</i>	annual hairgrass
<i>Epilobium pygmaeum</i>	smooth boisduvalia
<i>Eryngium aristulatum</i> var. <i>parishii</i>	San Diego button-celery
<i>Lilaea scilloides</i>	flowering quillwort
<i>Navarretia fossalis</i>	spreading navarretia
<i>Pogogyne nudiuscula</i>	Otay mesa mint
<i>Plantago elongata</i>	dwarf plantago
<i>Psilocarphus brevissimus</i>	woolly marbles
Other Native Vernal Pool Associates	
<i>Eleocharis macrostachya</i>	pale spike-sedge
<i>Juncus bufonius</i>	common toad-rush

*Based on Corps Vernal Pool Plant Indicator List (Corps 1997)

7.1.2 Restored Vernal Pool Indicator Species Richness

Only native vernal pool indicator species (Corps 1997) and selected native vernal pool associates (Table 10) would be included in species richness (the number of species in a given area) in the restored vernal pool quadrats. Annual performance goals expressed as a percent of vernal pool indicator species in control pools are addressed in Table 11. Acceptable species richness within each restored pool at the end of the 5-year monitoring period is 100 percent of the average control pool vernal pool species richness. Meeting the 100 percent criterion by Year 5 would show that pools are functioning and that they would be expected to continue functioning. If the species richness criterion for a given year is not met, corrective measures (e.g., reseeding, excavation of a portion of a basin, introducing new inoculum, berming of a pool edge, etc.) may be taken to ensure eventual achievement of long-term goals.

Table 11 RESTORED VERNAL POOL SPECIES RICHNESS SUCCESS CRITERIA		
Year	Number of Indicator Species Relative to Control Pools (percent)*	Minimum Number of Indicator Species Present in each pool
1	35	1
2	50	1
3	65	2
4	80	3
5	100	3

* Greater than or equal to amount shown.

7.1.3 Restored Vernal Pool Indicator Species Cover

In addition to species richness, cover of native vernal pool and associated wetland plants within the restored pools would be used to determine project success. At the end of the 5-year monitoring period, the total cover of vernal pool plant species in each restored vernal pool should be 100 percent of the average total cover value for the control pools. Yearly performance goals have been set to track the progress of the mitigation effort (Table 12). After the first year, the relative cover in each of the restored vernal pools should be at least 25 percent of the average relative cover measured in the control pools for the same year. This percentage is expected to increase annually relative to the control pools. For Years 2 through 5, the percentage should be 35, 50, 70, and 90 percent, respectively. If the annual goals for relative cover are not being met, additional measures would be taken as necessary to ensure final success including the addition of supplemental inoculum.

Table 12 RESTORED VERNAL POOL PLANT COVER SUCCESS CRITERIA	
Year	Cover of Indicator Species Relative to Control Pools (percent)*
1	25
2	35
3	50
4	70
5	90

*Greater than or equal to amount shown.

7.1.4 Restored Vernal Pool Weed Cover

Non-native weed species anticipated to encroach upon the vernal pools include Italian ryegrass, grass poly (*Lythrum hyssopifolia*), curly dock (*Rumex crispus*), rabbitsfoot grass (*Polypogon monspeliensis*), filaree (*Erodium* spp.), pacific bent grass (*Aristida avenaceae*), and nit grass (*Gastridium ventricosum*). Of these weed species, Italian ryegrass is considered to be the most significant competitor to native vernal pool species. Elimination of this species would be the main focus of the vernal pool weed control effort. Relative cover of Italian ryegrass shall not exceed one percent during the 5-year monitoring period. Control of weed species categorized as High or Moderate in the California Invasive Plant Council (Cal-IPC) 2006 Invasive Plant Inventory shall be conducted such that at the end of the 5-year monitoring period the total cover of such weed species in each restored vernal pool is less than one percent and total cover of weed species does not exceed 5 percent (Table 13). If weed cover criteria are not being met, additional maintenance effort would be required. Table 14 includes Cal-IPC listed species likely to occur within the mitigation project area.

Table 13 COVER LIMITS FOR NON-NATIVE SPECIES IN RESTORED VERNAL POOLS	
Cal-IPC Moderate or High species	<1%
Other non-native species	<5%
Absolute cover for all non-native species (Cal-IPC and others combined)	<5%

Table 14 CALIFORNIA INVASIVE PLANT COUNCIL MODERATELY TO HIGHLY INVASIVE PLANT SPECIES*	
SCIENTIFIC NAME	COMMON NAME
<i>Avena</i> spp.	wild oats
<i>Brassica nigra</i>	black mustard
<i>Bromus diandrus</i>	ripgut brome
<i>Bromus madritensis</i> ssp. <i>rubens</i>	red brome
<i>Centaurea melitensis</i>	toocalote
<i>Foeniculum vulgare</i>	fennel
<i>Hirschfeldia incana</i>	shortpod mustard
<i>Lolium multiflorum</i>	Italian ryegrass
<i>Lythrum hyssopifolia</i>	grass poly
<i>Vulpia myuros</i>	rattail fescue

*California Invasive Plant Council (Cal-IPC) 2006 Invasive Plant Inventory

7.1.5 Enhanced/Preserved Vernal Pool Success Criteria

The enhancement effort in the preserved pools is far less intensive than in the restored pools, consisting of an initial dethatching and periodic mowing of grasses. The goal of this effort is to help improve pool function (hydrology, wildlife, and plants) by reducing the dense thicket of non-native grasses that fill in many of the pools on an annual basis. In order to help direct this effort, success criteria have been established for the enhanced pools. The success goals for the enhanced pools include: exhibiting suitable ponding duration (7 – 14 days) to support San Diego fairy shrimp; stable or increasing presence of native vernal pool plant indicator species; and 0% cover of Cal-IPC list A-1 and A-2 species. The maintenance and monitoring effort will be directed to meet these goals; however, if the project fails to meet some or all of these goals and it can be shown that the maintenance effort was adequately performed, the project may still be deemed successful, provided the other success criteria are met.

7.2 SITE DETHATCHING

The goal of the dethatching is to improve the upland portion of the site for burrowing owls and also to help increase the water holding capacity of the preserved pools on site. Because of its somewhat experimental nature, there are no specific success criteria for the dethatching of the Lonestar Parcels. Implementation of the dethatching effort will be considered successful if the watershed dethatching is carried out correctly and in a timely manner. With improved ponding characteristics, it is anticipated that the preserved pools will better support the San Diego fairy shrimp. The project will include monitoring of both the owl presence and hydrology/fairy shrimp presence in the preserved pools to help determine if the effort is working. If, after the third year of monitoring the preserved pools do not exhibit improved ponding characteristics additional measures may be explored.

7.3 CRAM REFERENCE SITE/TARGET VALUES

A CRAM assessment for existing Lonestar pools was conducted by HELIX biologists Ms. Trnka and Erica Harris on March 3, 2011. In addition, off-site reference site pools were similarly assessed on March 12, 2011 by Ms. Trnka and Ms. Mattson. A CRAM assessment of the proposed mitigation site is not applicable, as the area does not currently support vernal pools and the proposed mitigation consists of creation of new pools in this area. The reference site pools consist of restored pools (i.e. created pools) on the restoration site directly south of the proposed mitigation. CRAM was conducted in 3 reference pools. CRAM also was conducted for 3 existing vernal pools on the Lonestar Parcel, north of the proposed vernal pool restoration area. The sampled pools were selected as a representative sampling of the varied size and quality of pools currently present at the Lonestar site and reference site.

The CRAM score for each of the existing pools was 52, while the CRAM scores for the reference site pools varied between 61 and 67, with a mean CRAM score of 65. The metric results for the Buffer and Landscape Context and Hydrology attributes are largely the same for the existing pools and the reference site pools, resulting in the same overall scores for these attributes (56 for Buffer and Landscape Context and 100 for Hydrology). The Buffer and Landscape Context attribute score was moderate, largely as a result of low scores for Landscape Connectivity (i.e., few wetlands within 500 m of the pools). The Hydrology attribute scores were high because the water source for the pools is mainly from rainfall coming directly into the basins, which fill and drain in natural cycles, and flow from the pools is largely unrestricted. The reference site scored higher than the existing site in both the Physical Structure and Biotic Structure attributes, scoring an average of 38 and 67, respectively, compared to the existing pool scores of 25 for both attributes. These higher scores are due to increased structural patch richness, higher species richness values, and less cover by non-native species at the reference site pools. Scoring sheets for the analyzed pools are included in Appendix A.

Typically, to fulfill the minimum requirement for no net loss of wetland functions and services, the net gain in CRAM scores at a mitigation site must be equal to or greater than the loss at the impact site. The mean CRAM score for the selected reference site is 65, 13 points higher than the mean CRAM score for both the impact site and the existing Lonestar Pools (Table 15). It is reasonable to expect that the mean score for the reference pools are attainable by the pools proposed by this project, and because the mitigation pools will consist of newly restored pools, the minimum score needed for the mitigation pools is 52 (equal to the mean score of the impacted pools).

Based on the reference site, the maximum possible CRAM score for the mitigation site was estimated to be 65; a minimum score of 52 within each pool is required (based on the scores at the impact pools; Table 15). Because the proposed mitigation would consist of the restoration of new pools where none currently exist (and, therefore, the pre-restoration CRAM score is zero), a mitigation ratio of 1:1 would attain a functional lift of 52 points for each restored pool. It should be noted that using the CRAM scores in this very simplified way and as the only factor in determining the mitigation ratio is not typical for the Corps. The Corps currently utilizes 5 factors to establish mitigation ratios including mitigation site location, type, type conversion, uncertainty, and temporal loss. Several of these factors may weigh heavily in determining the

Corps mitigation ratio for a project affecting vernal pools because they are a difficult aquatic resource to replace. Based on consultation with the Corps, USFWS, and RWQCB the combined mitigation ratio for this project is 5:1.

Table 15
CRAM DATA SUMMARY

CRAM Attributes	METRICS	BASELINE SCORES ¹				TARGET SCORES	
		Impact Site	Existing Lonestar Pools	Reference Site	Post-Restoration Mitigation Pools ²	Year 3	Year 5
Buffer and Landscape Context	Landscape Connectivity	3	3	3		3	3
	Buffer Sub-metrics:						
	- Percent of Assessment Area with Buffer	12	12	12		12	12
	- Average Buffer Width	11	12	12		12	12
	- Buffer Condition	6	9	9		9	9
	Attribute Score (Raw/Final)	11/47	13/56	13/56		13/56	13/56
Hydrology	Water Source	12	12	12		12	12
	Hydroperiod	9	12	12		12	12
	Hydrologic Connectivity	12	12	12		12	12
	Attribute Score (Raw/Final)	33/92	36/100	36/100		36/100	36/100
Physical Structure	Structural Patch Richness	5	3	5		5	5
	Topographic Complexity	3	3	4		4	4
	Attribute Score (Raw/Final)	8/33	6/25	9/38		9/38	9/38
Biotic Structure	Plant Community Sub-metrics:						
	- Number of Co-dominant Species	4	3	4		4	4
	- Percent Invasion	3	3	12		8	12
	- Endemic Species Richness	3	3	4		3	4
	Horizontal Interspersion and Zonation	5	3	9		3	9
	Attribute Score (Raw/Final)	9/37	6/25	16/67		8/35	16/67
Overall Score		52	52	65		57	65

1 Mean scores calculated from CRAM scores conducted on 5 impact site pools, 3 existing Lonestar pools, and 3 off-site reference site pools.

2 To be conducted immediately following restoration installation

7.4 FAIRY SHRIMP

All of the restored vernal pools are intended to provide habitat for San Diego fairy shrimp. Some of the basins are designed to be deep enough to support a hydrological regime long enough to support Riverside fairy shrimp. Fairy shrimp sampling (wet and dry) would be conducted each season and the number of shrimp/cysts present in each pool would be estimated. The number of gravid females also would be estimated. Fairy shrimp data also would be collected in the control pools to help gauge the success of the restoration effort. At the end of the 5-year monitoring period a minimum of .42 acre of restored pool surface area must support fairy shrimp. In order for the fairy shrimp portion of the project to be considered successful, the shrimp (with gravid females) should recur in each year that there is enough rainfall to produce ponding, and shrimp should also be present in the control pools.

Additionally, the survey data must show that the populations are stable or increasing, relative to the control pools. If both the restored and control pool shrimp populations/cyst banks decline in any given year, then it would be assumed that there are other outside, seasonal effects driving the change, as opposed to specific factors at the restoration site. Otherwise, the restored pool population numbers should either be stable or show an increasing trend over the 5-year monitoring period to be considered successful. If the restored pools exhibit appropriate hydrology but do not have sufficient presence of fairy shrimp, additional inoculum would be added.

Versatile fairy shrimp (*Branchinecta lindahli*) may co-occur with San Diego fairy shrimp in pools in Otay Mesa. All wet season fairy shrimp monitoring will document the presence and abundance of versatile fairy shrimp, if any. The presence of versatile fairy shrimp will not be counted in determining success of the pool restoration.

7.5 TARGET HYDROLOGICAL REGIME

As previously stated, vernal pools restored under this mitigation program are primarily designed to emulate the conditions found in existing vernal pools on Otay Mesa. The restored pools would be excavated and situated to capture rainfall and runoff from the open space preserve. Restoration of the natural topography and the removal of weeds would restore the normal hydrological functions within the restored vernal pool complex.

During the 5-year monitoring period, water depth in the control pools and the restored vernal pools on site would be measured. Measurements would be taken every 2 weeks during each rainy season throughout the monitoring period. The depth and extent of ponding (surface area) would be recorded during each site visit in each restored vernal pool. This data would be used to create graphs showing extent, depth, and duration of ponding. At the end of the 5-year monitoring period, the monitored pools would demonstrate hydrologic patterns similar to those of the control pools. The monitoring period will be extended if a drought period prevents the pools from demonstrating the desired hydrologic patterns. The pools must pond for sufficient time (estimated to be 30 days) to support San Diego fairy shrimp during 2 winters in a 5-year monitoring period or 3 winters in a 10-year monitoring period. This allows the resource agencies

to be confident that the pools physical and chemical structure support a viable population of fairy shrimp vs. the possibility of cysts inoculated emerging a single time.

7.6 RARE PLANT TRANSLOCATION

The goal of the variegated dudleya translocation effort is to obtain populations of similar size to the impacted population by the end of the 5-year restoration program. At the end of each year, if the population does not appear to be progressing toward this goal, variegated dudleya plantings or seed will be obtained from a native plant nursery and applied to the restoration area.

At the end of each year, survivorship of San Diego barrel cactus will be tabulated. If there is a survivorship of less than 90 percent, additional San Diego barrel cactus will be obtained from a native plant nursery and added to the restoration site to replace lost individuals.

At the end of the 5-year restoration program at least 2 restored pools will support San Diego button celery and spreading navarretia with no less than 6 individuals of each species occurring within the restoration area. Additional seed of these species may be collected and placed in the pools if it appears that the success criterion will not be met. Any collection must be approved by the USFWS.

7.7 NATIVE GRASSLAND RESTORATION AREA

During annual monitoring, species richness in the native grassland area in the vernal pool restoration area would be determined only by visual assessment in Years 1 and 2, and by visual assessment and transect data in Years 3, 4, and 5. No specific richness criteria are established for Years 1 or 2, but annual success criteria for species richness in Years 3, 4, and 5 are provided in Table 16. As suitable native grassland reference sites are not known on Otay Mesa, success will not be compared to a reference site. Instead, success will be measured relative to predetermined richness values. If the species richness goal for a given year is not met, corrective measures (including reseeding and planting) would be implemented to ensure achievement of long-term restoration goals.

Table 16 NATIVE GRASSLAND RESTORATION SPECIES RICHNESS SUCCESS CRITERIA	
YEAR*	SPECIES RICHNESS
3	5
4	6
5	8

*No success criteria for Years 1 and 2

In addition to species richness, project success would be determined based on native and non-native (weed) plant cover. Table 17 presents vegetative cover success criteria for Years 3, 4, and 5 in the native grassland restoration area. No specific richness criteria are established

for Years 1 or 2 in the native grassland restoration area. Several species of weeds are particularly problematic in the vicinity of the restoration site. Control of these target, invasive, site specific, weed species (Table 18) shall be conducted such that at the end of the 5-year monitoring period, the total cover of these weed species within the native grassland is less than one percent and total cover of all weed species does not exceed 5 percent (Table 17). If annual goals for vegetative cover are not met, remedial measures, including reseeding, planting, and weeding, may be implemented to ensure final success.

Table 17 NATIVE GRASSLAND RESTORATION VEGETATIVE COVER SUCCESS CRITERIA (percent cover)			
YEAR*	NATIVE SPECIES	NON-NATIVE SPECIES	TARGET WEEDS†
3	>25	<10	<5
4	>35	<5	<1
5	>45	<5	<1

*No success criteria for Years 1 and 2

†Table 18

Table 18 TARGET NATIVE GRASSLAND WEED SPECIES	
SCIENTIFIC NAME	COMMON NAME
<i>Atriplex semibaccata</i>	Australian saltbush
<i>Brassica nigra</i>	black mustard
<i>Centaurea melitensis</i>	totalote
<i>Foeniculum vulgare</i>	fennel
<i>Hirschfeldia incana</i>	shortpod mustard
<i>Lolium multiflorum</i>	Italian ryegrass

As mima mound habitat suitable for the long-term preservation of vernal pools currently exists within the vernal pool restoration area, no success criteria are proposed for the Diegan coastal sage scrub habitat enhancement. Installation and maintenance of Diegan coastal sage scrub species would enhance the vernal pool watersheds and successful establishment would enhance the value of the mitigation site, but is not essential for continued pool function.

7.8 SUCCESS CRITERIA FOR ARTIFICIAL BURROWS

The degree to which burrowing owls utilize artificial burrows and foraging habitat will be documented through the monitoring program; however, there are no success criteria for this effort. If this burrowing owl mitigation plan is implemented correctly, and burrowing owls are

not found to be utilizing the artificial burrows or preserved foraging habitat, there will be no consequences for the project proponent. Installation of artificial burrows and preservation of habitat is considered successful mitigation.

7.9 SUCCESS CRITERIA FOR FOCUSED QCB PLANTING AREAS

A minimum of 6 focused planting areas shall be established that support habitat dominated by QCB host and nectar resource plants. The planting areas must have less than 10% cover of exotic plant species and 0% cover of Cal-IPC List A-1 and A-2 species during the 5-year maintenance and monitoring period.

7.10 CONTAINER STOCK SURVIVAL

Container plant survival will be 80 percent of the initial plantings during each annual monitoring event, for all five years of maintenance and monitoring. At the first and second anniversary of plant installation, all dead plants will be replaced unless their function has been replaced by natural recruitment.

7.11 SUCCESS CRITERIA SUMMARY

A summary of the project's success criteria is presented below in Table 19.

Table 19 SUCCESS CRITERIA SUMMARY		
VERNAL POOL SPECIES RICHNESS SUCCESS CRITERIA		
Year	Number of Indicator Species Relative to Control Pools (percent)	Minimum Number of Indicator Species Present in each Pool
1	35	1
2	50	1
3	65	2
4	80	3
5	100	3
VERNAL POOL PLANT COVER SUCCESS CRITERIA		
Year	Cover of Indicator Species Relative to Control Pools (percent)	
1	25	
2	35	
3	50	
4	70	
5	90	

Table 19 (cont.) SUCCESS CRITERIA SUMMARY			
COVER LIMITS FOR NON-NATIVE SPECIES IN VERNAL POOLS			
Cal-IPC Moderate or High species			<1%
Other non-native species			<5%
Absolute cover for all non-native species (Cal-IPC and others combined)			<5%
NATIVE GRASSLAND RESTORATION SPECIES RICHNESS SUCCESS CRITERIA			
Year*		Species Richness	
3		5	
4		6	
5		8	
NATIVE GRASSLAND RESTORATION VEGETATIVE COVER SUCCESS CRITERIA			
Year*	Native Cover**	Non-native Cover†	Target Weeds‡
3	≥25	<10	<5
4	≥35	<5	<1
5	≥45	<5	<1

*No success criteria for Years 1 and 2

** percent relative to reference transect

† total cover – not relative to reference

8.0 MONITORING PLAN

8.1 MONITORING METHODS

Monitoring would be carried out by the restoration specialist to assess the progress of the restoration effort and determine any appropriate remedial measures. Monitoring by the restoration specialist allows for the identification of action items and the implementation of adaptive strategies to achieve high functioning habitat and reach final performance standards. Quantitative success criteria presented above (Section 7) would be used to measure mitigation success. Final and yearly success criteria are included to measure interim and ultimate habitat development.

8.1.1 Vernal Pools

Maintenance Monitoring

Monthly inspections of the restoration and maintenance efforts would be performed during Year 1, every other month during Year 2, and every 3 months during the remainder of the

monitoring period. As conditions warrant, additional site visits may be required during the initial installation/establishment period.

Fairy Shrimp Monitoring

Wet season fairy shrimp monitoring visits would be conducted every other week during the rainy season of each year to monitor pool hydrology and conduct wet season fairy shrimp surveys. These surveys will be conducted in all of the restored pools, the control pools, and in a minimum of 10 selected enhanced/preserved pools. During each of these visits, depth, extent, and duration of inundation of all pools (mitigation and control) would be measured. Depth measurements would be taken following the onset of winter rains and would continue until May 15 or until all pools are dry. Plant and animal species observed in each pool during the monitoring visits would be recorded.

The purpose of the fairy shrimp surveys is to determine presence/absence of San Diego and Riverside fairy shrimp in the restored pools, in particular the estimated population size of hatched fairy shrimp, and estimates on the number of gravid female. The presence of other faunal species occupying the pools also would be noted during the surveys. The results of the fairy shrimp surveys would be included in the annual monitoring reports.

Additional water chemistry data will be collected during the fairy shrimp sampling of the restored pools. The data collected will include temperature, pH, conductivity, TDS, and salinity. This same data will be collected within a minimum of 10 representative pools from the preserved/enhanced pools on site. Results will be recorded and compared with fairy shrimp presence in the annual report for each year. This data is intended to contribute to the general body of knowledge regarding necessary water quality characteristics for fairy shrimp survival and is not a component of project success determination (i.e. there are no associated success criteria).

Dry season fairy shrimp surveys also will be conducted in the fall of each year, prior to the onset of the rainy season. The survey will involve collecting soil samples from the restored vernal pools along with a minimum of 10 preserved/enhanced pools and 5 control pools that are known to support fairy shrimp. The sampling will consist of 3 core samples (approximately 1.5 – 2 cubic inches in volume) taken in the deepest portion of each sampled pool. The samples will be analyzed by a USFWS qualified biologist to determine the genus and density of cysts collected. This data will be used to track any trends in cyst densities in the monitored pools.

Annual Monitoring

An annual monitoring visit would be conducted each year near the end of the rainy season when most vernal pool species are visible. The exact timing of annual monitoring would be dependent upon the time and amount of rainfall received each year. Monitoring would use standard techniques and be based on transect/quadrat sampling. The transect monitoring will be conducted in all of the restored pools, the control pools, and in a minimum of 10 preserved/enhanced pools. Permanent transects would be established from pool edge to pool edge through the deepest portion of each pool. Each transect would be marked with rebar stakes

at both ends and labeled with caps indicating the pool number. Decimeter quadrats would be measured at regular intervals along each transect. Each plant species present within each quadrat would be recorded, with the cover of each species estimated. Furthermore, the total vernal pool, native, and non-native covers for each quadrat would be estimated. A species list would be recorded for each pool, consisting of all species observed in the annual sampling transect and any other species observed in each pool during annual monitoring events. This species list will be used to determine pool species richness.

Photo documentation points shall be established for the preserve area, and photographs would be taken of each pool during the annual monitoring event. Representative photos would be provided in the annual monitoring report.

8.1.2 Upland Habitat

Native Grassland

The status of the native grassland area would be noted during each monitoring visit throughout the year. Overall health and vigor of the upland habitat would be qualitatively recorded. Species cover, richness, and weed cover would be visually estimated.

During annual monitoring, species richness in the native grassland upland area would be determined by visual assessment only in Years 1 and 2 and by visual assessment and quantitative transect data in Years 3, 4, and 5.

Quantitative measurements of plant growth would be taken along transects using the point intercept line transect sampling methods described in the California Native Plant Society's Field Sampling Protocol (Sawyer and Keeler-Wolf 1995). Two 25-m long by 5-m wide sampling transects would be established in Year 3. Each transect end would be physically marked, and have its location recorded with a Global Positioning System (GPS) unit. With this transect sampling method, a point would be projected into the vegetation at 50-centimeter (cm) intervals along each transect and each species intercepted by the point would be recorded. For this site, plants would be divided into 3 height categories: herb layer (between 0 and 60 cm), shrub layer (between 61 cm and 3 m), and tree layer (greater than 3 m).

To calculate total vegetation percent cover, the number of points that intercept live plant material is summed and divided by the total number of intercepts possible along that transect. Multiple hits of plants at a single point resulting from overlap of 2 or more species were counted as a single hit for this calculation. To calculate the percent cover contributed by each species, the number of intercepts by each species is divided by the number of possible intercepts for the transect (i.e., 100).

All plant species observed within the 25 m by 5 m belt transect (excluding those within vernal pools) would be recorded and used to calculate the species richness. All plants observed would be categorized by origin (native/non-native) and stratum (herb, shrub).

Photographs would be taken each year from the same locations to monitor change over time, and would be included in each annual report. Photopoints would be physically marked and have their locations recorded with a GPS unit.

Diegan Coastal Sage Scrub

Diegan coastal sage scrub habitat in the uplands around the restored vernal pools will be qualitatively monitored during each annual monitoring event. Photographs would be taken each year.

QCB Habitat

The QCB habitat focused planting areas would be qualitatively inspected during each annual monitoring event. Observations would be taken on native and non-native plant cover and species diversity.

Rare plant

During the annual monitoring visit the number and species cover within the variegated dudleya area will be visually estimated. The collected data will be used to determine the success of the planted area.

The survivorship of transplanted San Diego barrel cactus and of container stock cactus plantings will be recorded.

8.1.3 Artificial Burrows

Monitoring of the artificial burrows shall be carried out by a qualified biologist and shall include the following observations: presence of owls and other burrowing animals, burrow use, general available prey base, vegetation condition (in particular height) around burrows, other predatory animal species that could prey on burrowing owls and/or compete with them for food, and any maintenance concerns as described above.

Monitoring shall occur for 5 years according to the schedule below. The majority of visits occur during the breeding (April 15 through July 15) and wintering seasons (December 1 through January 31) of burrowing owls. This schedule is designed under the assumption that monitoring would begin following artificial burrow construction. The specialist shall have reasonable flexibility to alter the exact timing of monitoring events in response to on-site observations/conditions.

Monitoring would occur according to the following schedule:

- Year 1 (12 monitoring events; one monitoring event per month).
- Years 2 through 5 (8 monitoring events per year) as follows: December 1 through January 31 – 3 logically spaced events; February 1 through April 14 – one event; April 15 through July 15 – 3 logically spaced events; and July 16 through November 30 – one event.

Monitoring events should occur concurrently with other site monitoring visits (e.g. maintenance monitoring, fairy shrimp surveys).

8.2 ANNUAL REPORTS/INVITATION

As part of the monitoring program, annual reports prepared by the restoration specialist would be submitted to the County, Corps, CDFG, and USFWS evaluating the success of the vernal pool mitigation effort to date, along with any recommendations for future work that may be deemed necessary. These reports will include an evaluation of the success of the burrowing owl effort to date. Each annual monitoring report would include data collected throughout the year in addition to the annual monitoring visit. Annual monitoring reports would provide comparisons of the annual monitoring data to the control site for that year. To detect the overall trend of the site, the annual monitoring report would contain comparisons of the monitoring data for the years that data are collected. As part of the annual reporting, the CRAM data and vernal pool boundaries will be uploaded to the cramwetlands.org website and the data provided in the annual monitoring report. This data can then be used to further the calibration of CRAM for vernal pools such that if the method is updated during the monitoring period, the data can be cross-walked easily by the project restoration specialist and by the CRAM managers.

The USFWS, Corps, CDFG, RWQCB, and County shall be annually invited to view the mitigation site.

8.3 ADAPTIVE MANAGEMENT

If any annual goals for the project are not being met, or the restoration specialist observes that some aspect of the restoration program requires attention, adaptive measures would be implemented. Adaptive measures for vernal pool restoration project may include but are not limited to: importing new soil inoculum from an off-site source, recontouring of non-functioning pools, increasing weed maintenance frequency or intensity, and re-seeding with commercially available or collected seeds from the immediate area.

If the native grassland restoration within the restored vernal pool watershed area does not achieve the desired levels of cover or richness, adaptive management measures could include: additional planting or seeding, altered maintenance effort, and increased irrigation regime. Additional measures may be implemented in the vernal pool enhancement area if deemed necessary.

Native plants in the existing non-native grasslands on site are expected to emerge after grass thatch has been removed. During the second annual monitoring, the restoration specialist will assess the

uplands (watershed enhancement area) for the emergence of natives. If native plants are not emerging as expected, the site will be seeded with a mix of native forb and shrub species.

Artificial owl burrows will be monitored for integrity and will be repaired if erosion or sedimentation occurs around the entrances.

If maintenance monitoring indicates that the restoration program is not progressing towards meeting its performance standards as anticipated, the restoration specialist must notify the regulatory agencies as soon as possible, suggest site specific recommendations, and work with the regulatory agencies to address deficiencies. The goal of adaptive management is to ultimately provide vernal pool and grassland functions consistent with those described in this restoration plan.

8.4 SCHEDULE

As described above, monthly inspections of the restoration and maintenance effort would be performed during Year 1, every other month during Year 2, and every 3 months for the remainder of the monitoring period. Monitoring events that focus on botanical data collection (i.e., percent cover, density, phenology, etc.) would occur annually for 5 years. Reports would be prepared and submitted to the USFWS, Corps, CDFG, and County by September 1 of each year to ensure that adequate time remains in the dry season to make any necessary alterations to the preserve areas.

9.0 COMPLETION OF MITIGATION

9.1 NOTIFICATION OF COMPLETION

The permittee shall notify the USFWS, Corps, CDFG, and County of completion of the mitigation effort through submittal of a final (Year 5) monitoring report. The final monitoring report would include a jurisdictional delineation of the mitigation areas. This delineation must show that the goals of the mitigation program (as described in Section 3) have been met. The Permittee will set up a site visit with the resource agencies and only once the permittee receives a written confirmation from the resource agencies that the site had meet its success criteria will maintenance and monitoring cease.

9.2 AGENCY CONFIRMATION

After receipt of the final monitoring report, the USFWS, Corps, CDFG, and County may inspect the mitigation site to determine the success of the restoration effort. After evaluating the final report, the agencies shall determine if the restoration effort is acceptable.

9.3 LONG-TERM MANAGEMENT

Prior to initiation of project impacts, a Biological Open Space Easement or Conservation Easement dedication will be recorded over the vernal pool mitigation areas. This easement will be in favor of an entity approved by the Service. The Service will be named as third party

beneficiary in the conservation easement and the terms of the easement will be approved by the Service prior to its execution. This easement will state that no other easements or activities (e.g., fuel modification zones, public trails, drainage facilities, walls, maintenance access roads) that would result in soil disturbance and/or vegetation removal will be allowed within the biological conservation easement area. A draft conservation easement agreement will be submitted to the Service for review and approval at least 90 days prior to initiating project impacts and will not initiate project impacts until the easement is approved by the Service. The final easement and evidence of its recordation will be submitted to the Service within 90 days of recordation of the final map. These areas will be turned over in fee-title to the County, the NWR, or a non-profit organization, and approved by the Service dedicated to the preservation of sensitive lands. Long-term management of the vernal pool mitigation areas would be the responsibility of the organization accepting the fee-title. As of the writing of this report, no entity has been chosen to accept long-term responsibility of the restoration areas. Potential entities could include the County, USFWS, CDFG, or a non-profit land management company. Long-term management would be conducted according to the Resource Management Plan for Otay Business Park Off-Site Biological Open Space at Lonestar Ridge (HELIX 2011b).

10.0 CONTINGENCY MEASURES

10.1 INITIATING PROCEDURES

If the Corps, CDFG, USFWS, and County determine upon receipt of any of the annual monitoring reports that the restoration effort is not meeting success standards for the project, the Corps, CDFG, USFWS, and County shall notify the project proponent in writing (via letter or email) that the restoration effort may require augmentation for successful implementation. The project proponent shall then have 30 days to respond to the notification. During this period, the project proponent may discuss alternatives to the suggestions of the USFWS, Corps, CDFG, and County.

10.2 FUNDING MECHANISM

The permittee (Section 4.5) shall be responsible for all costs associated with any remedial measures.

10.3 RESPONSIBLE PARTIES

The permittee shall be the responsible party for any remedial measures.

11.0 LIST OF PREPARERS

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Appendix A

CRAM SCORING SHEETS AND BUFFER ANALYSES



Basic Information: Individual Vernal Pools

Which best describes the hydrologic state of the wetland at the time of assessment?

☒ ponded/inundated ☐ saturated soil, but no surface water ☐ dry

What is the apparent hydrologic regime of the wetland?

☐ long-duration ☐ medium-duration ☐ short-duration

Does the individual vernal pool connect with the floodplain of a nearby stream? ☐ yes ☒ no

photo 384 = P1
85

Sally Trnka
Amy Mattson

Scoring Sheet: Individual Vernal Pools

AA Name: P-1				(m/d/y)	02/27/11
Attributes and Metrics		Alpha.	Numeric	Comments	
Buffer and Landscape Context					
→ (A) Landscape Connectivity		D	3	only road/vernal pools w/in 500m	
→ (B): Percent of AA with Buffer	Alpha.	A	12	100% w/ buffer	
(C): Average Buffer Width		A	12	250m	
→ (D): Buffer Condition		C	6	non-native grassland & dirt rd.	
Initial Attribute Score = $A + [D \times (B \times C)]^{1/2}$ $3 + [6 \times (12 \times 12)]^{1/2}$			11.4	Final Attribute Score = (Initial Score/24) x 100	47.5
Hydrology					
→ Water Source		A	12	natural precipitation	
→ Hydroperiod		B	9	slightly deeper portions due to vehicle travel	
→ Hydrologic Connectivity		A	12	unrestricted	
Initial Attribute Score			33	Final Attribute Score = (Initial Score/36) x 100	91.7
Physical Structure					
Structural Patch Richness		D	3	very simple pool in rd.	
Topographic Complexity		D	3	no slope (or very slight), road ruts	
Initial Attribute Score			6	Final Attribute Score = (Initial Score/24) x 100	25
Biotic Structure					
Plant Community submetric A: Number of Co-dominant species	Alpha.	C	6	3 species	
Plant Community submetric B: Percent Invasion		D	3	67%	
Plant Community submetric C: Endemic Species Richness		D	3	0 endemic	
Plant Community Metric (average of submetrics A-C)			4		
Horizontal Interspersion and Zonation			C	6	2 main zones
Initial Attribute Score			10	Final Attribute Score = (Initial Score/24) x 100	41.7
Overall AA Score (Average of Final Attribute Scores)				51.5 = <u>52</u>	

205.9/4 =

Worksheet 1: Landscape Connectivity Metric for Individual Vernal Pools.

Percentage of Each Transect Line Crossing Wetland or Other Aquatic Habitat	
Transect	Percent Crossing Aquatic Area
North	<5%
South	<5%
East	10% <5%
West	10% <5%
Average Percent Crossing Aquatic Area for all Four Transects	10% <5%

Worksheet 2: Calculating average buffer width of AA.

Transect	Buffer Width (m)
A	>250m
B	↓
C	
D	
E	
F	
G	
H	↓
Average Buffer Width	250m

Worksheet 3: Structural Patch Type for Vernal Pool Systems.

Identify each type of patch that is observed in the AA and use the total number of observed patch types in Table 15. Patch type definitions are provided on the next page.

Structural Patch Type	Check for presence
Small individual pools	✓
Large individual pools	
Small swales	
Large swales	
More than 1 pool cluster (a set of 3 or more interconnected pools with nearest neighbors less than 5 m apart)	
Drainage branches (more than 1 drainage branch)	
Simply-shaped pools (mostly round or oval)	
Complexly-shaped pools (not mostly round or oval)	✓
Plant hummocks	
Mima mounds	
Animal burrows	
Bare soil	✓
Soil cracks	
Cobble	
Total Possible	14
No. Observed Patch Types (enter here and use in Table 15)	3

- based on presence of road ruts, which vary year to year, day to day

Worksheet 4a: Plant Community Metric –

Co-dominant Plant Species in Individual Vernal Pools.

Note: A dominant species represents $\geq 10\%$ relative cover. Count species only once when calculating any Plant Community sub-metric.

Co-dominant Species	
Hordeum jubatum	
Lepidium sp. Avena sp.	
Malva parviflora	
Total number of co-dominant species	3

Worksheet 4b: Plant Community Metric –

List of Unique Co-dominant Plant Species in Individual Vernal Pool.

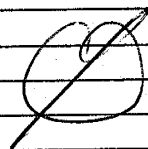
Plant Name	Check if invasive	Check if in Appendix I
Hordeum jubata		
Lepidium sp. Avena sp.	✓	
Malva parviflora	✓	
Total number of co-dominant species (A)	3	
Total number of co-dominant species that are invasive (B)	2	
Percent Invasion $[(B)/(A) \times 100]$ (enter here and use in Table 19)	67	
Total number of co-dominant species that are endemic (enter here and use in Table 20)	0	

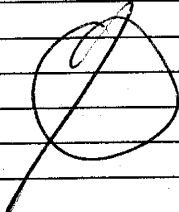
Wetland disturbances and conversions.

Has a major disturbance occurred at this wetland?	<u>Yes</u>	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	<u>other</u>
If yes, then how severe is the disturbance?	<u>likely to affect site next 5 or more years</u>	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	Lacustrine	seep or spring	playa	

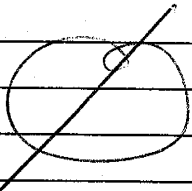
Repeated disturbance from vehicles using dirt road which encompasses a portion of the pool.

Worksheet 5: Stressor Checklist.

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)		
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		
		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Filling or dumping of sediment or soils (N/A for restoration areas)		
Grading/ compaction (N/A for restoration areas)		
Plowing/Discing (N/A for restoration areas)		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		
		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation	✓	
Predation and habitat destruction by non-native vertebrates (e.g., <i>Virginia opossum</i> and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	✓	
Lack of treatment of invasive plants adjacent to AA or buffer	✓	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		
 Based on size of watershed of the pool, development should not have impact currently.		

Basic Information: Individual Vernal Pools

Which best describes the hydrologic state of the wetland at the time of assessment?

- ☒ ponded/inundated ☐ saturated soil, but no surface water ☐ dry

What is the apparent hydrologic regime of the wetland?

- ☐ long-duration ☐ medium-duration ☐ short-duration

Does the individual vernal pool connect with the floodplain of a nearby stream? ☐ yes ☒ no

photo 6 = P 2

Sally Tonke
Amy Mattson

Scoring Sheet: Individual Vernal Pools

AA Name: <u>Pine 2</u>			(m/d/y)	<u>02/27/11</u>	
Attributes and Metrics		Alpha.	Numeric	Comments	
Buffer and Landscape Context					
(A) Landscape Connectivity		<u>D</u>	<u>3</u>	<u>only vernal/road pools with 500m</u>	
(B): Percent of AA with Buffer	Alpha. <u>A</u>	Numeric <u>12</u>	<u>100% with buffer</u>		
(C): Average Buffer Width	<u>A</u>	<u>12</u>	<u>250m</u>		
(D): Buffer Condition	<u>C</u>	<u>6</u>	<u>non-native grassland & dirt road</u>		
Initial Attribute Score = $A + [D \times (B \times C)]^{1/2}$			<u>11.4</u>	Final Attribute Score = (Initial Score/24) x 100	<u>47.5</u>
Hydrology					
Water Source		<u>A</u>	<u>12</u>	<u>natural precipitation</u>	
Hydroperiod		<u>B</u>	<u>9</u>	<u>slightly deeper portions due to vehicle travel</u>	
Hydrologic Connectivity		<u>A</u>	<u>12</u>	<u>unrestricted</u>	
Initial Attribute Score			<u>33</u>	Final Attribute Score = (Initial Score/36) x 100	<u>91.7</u>
Physical Structure					
Structural Patch Richness		<u>C</u>	<u>6</u>	<u>very simple pool in rd.</u>	
Topographic Complexity		<u>D</u>	<u>3</u>	<u>no slope, road cuts</u>	
Initial Attribute Score			<u>9</u>	Final Attribute Score = (Initial Score/24) x 100	<u>37.5</u>
Biotic Structure					
Plant Community submetric A: Number of Co-dominant species	Alpha. <u>C</u>	Numeric <u>6</u>	<u>3 spp.</u>		
Plant Community submetric B: Percent Invasion	<u>D</u>	<u>3</u>	<u>100%</u>		
Plant Community submetric C: Endemic Species Richness	<u>D</u>	<u>3</u>	<u>0 endemic</u>		
Plant Community Metric (average of submetrics A-C)			<u>4</u>		
Horizontal Interspersion and Zonation		<u>D</u>	<u>3</u>	<u>non-native grassland throughout</u>	
Initial Attribute Score			<u>7</u>	Final Attribute Score = (Initial Score/24) x 100	<u>29.2</u>
Overall AA Score (Average of Final Attribute Scores)				<u>51.5 = 52</u>	

205.9/4 ↑

Worksheet 1: Landscape Connectivity Metric for Individual Vernal Pools.

Percentage of Each Transect Line Crossing Wetland or Other Aquatic Habitat	
Transect	Percent Crossing Aquatic Area
North	45%
South	↓
East	
West	
Average Percent Crossing Aquatic Area for all Four Transects	

Worksheet 2: Calculating average buffer width of AA.

Transect	Buffer Width (m)
A	250m
B	↓
C	
D	
E	
F	
G	
H	
Average Buffer Width	250m

Worksheet 3: Structural Patch Type for Vernal Pool Systems.

Identify each type of patch that is observed in the AA and use the total number of observed patch types in Table 15. Patch type definitions are provided on the next page.

Structural Patch Type	Check for presence
Small individual pools	
Large individual pools	✓
Small swales	
Large swales	
More than 1 pool cluster (a set of 3 or more interconnected pools with nearest neighbors less than 5 m apart)	
Drainage branches (more than 1 drainage branch)	
Simply-shaped pools (mostly round or oval)	
Complexly-shaped pools (not mostly round or oval)	✓
Plant hummocks	✓
Mima mounds	
Animal burrows	
Bare soil	✓
Soil cracks	
Cobble	
Total Possible	14
No. Observed Patch Types (enter here and use in Table 15)	4

Worksheet 4a: Plant Community Metric –

Co-dominant Plant Species in Individual Vernal Pools.

Note: A dominant species represents $\leq 10\%$ *relative* cover. Count species only once when calculating any Plant Community sub-metric.

Co-dominant Species	
Total number of co-dominant species	3

Worksheet 4b: Plant Community Metric –


List of Unique Co-dominant Plant Species in Individual Vernal Pool.

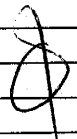
Plant Name	Check if invasive	Check if in Appendix I
Lolium (awn)	✓	
Avena barbate	✓	
Bromus diandrus	✓	
Total number of co-dominant species (A)	3	
Total number of co-dominant species that are invasive (B)	3	
Percent Invasion $[(B)/(A) \times 100]$ (enter here and use in Table 19)	100%	
Total number of co-dominant species that are endemic (enter here and use in Table 20)	0	

Wetland disturbances and conversions.

Has a major disturbance occurred at this wetland?	<u>Yes</u>	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	<u>other</u>
If yes, then how severe is the disturbance?	<u>likely to affect site next 5 or more years</u>	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	Lacustrine	seep or spring	playa	

Worksheet 5: Stressor Checklist.

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)		
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		
		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Filling or dumping of sediment or soils (N/A for restoration areas)		
Grading/ compaction (N/A for restoration areas)		
Plowing/Discing (N/A for restoration areas)		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		
		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation	✓	
Predation and habitat destruction by non-native vertebrates (e.g., <i>Virginia opossum</i> and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	✓	
Lack of treatment of invasive plants adjacent to AA or buffer	✓	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		
<p>Based on size of watershed of the pool, development should not have current impacts.</p>		

Basic Information: Individual Vernal Pools

Which best describes the hydrologic state of the wetland at the time of assessment?

- ☒ ponded/inundated ☐ saturated soil, but no surface water ☐ dry

What is the apparent hydrologic regime of the wetland?

- ☐ long-duration ☐ medium-duration ☐ short-duration

Does the individual vernal pool connect with the floodplain of a nearby stream? ☐ yes ☒ no

Sally T
Amy M

photo 7 - P3

Scoring Sheet: Individual Vernal Pools

AA Name: P-3			(m/d/y)	2/27/11	
Attributes and Metrics		Alpha.	Numeric	Comments	
Buffer and Landscape Context					
(A) Landscape Connectivity		D	3	only rd + VPs w/in 500m	
(B): Percent of AA with Buffer	Alpha.	A	12	100% buffer	
(C): Average Buffer Width	Alpha.	A	12	250m	
(D): Buffer Condition	Alpha.	C	6	NNG + dirt rds	
Initial Attribute Score = $A + [D \times (B \times C)^{1/2}]^{1/2}$			11.4	Final Attribute Score = (Initial Score/24) x 100	47.5
Hydrology					
Water Source		A	12	natural precip.	
Hydroperiod		B	9	slightly deeper portions due to vehicle traffic	
Hydrologic Connectivity		A	12	unrestricted	
Initial Attribute Score			33	Final Attribute Score = (Initial Score/36) x 100	91.7
Physical Structure					
Structural Patch Richness		D	3	very simple pool	
Topographic Complexity		D	3	no slope, road cuts	
Initial Attribute Score			6	Final Attribute Score = (Initial Score/24) x 100	25
Biotic Structure					
Plant Community submetric A: Number of Co-dominant species	Alpha.	D	3	2 spp.	
Plant Community submetric B: Percent Invasion	Alpha.	D	3	100%	
Plant Community submetric C: Endemic Species Richness	Alpha.	D	3	0	
Plant Community Metric (average of submetrics A-C)			3		
Horizontal Interspersion and Zonation		BC	6		
Initial Attribute Score			9	Final Attribute Score = (Initial Score/24) x 100	37.5
Overall AA Score (Average of Final Attribute Scores)				201.7/4 = 50	

Worksheet 1: Landscape Connectivity Metric for Individual Vernal Pools.

Percentage of Each Transect Line Crossing Wetland or Other Aquatic Habitat	
Transect	Percent Crossing Aquatic Area
North	45%
South	↓
East	
West	
Average Percent Crossing Aquatic Area for all Four Transects	45%

Worksheet 2: Calculating average buffer width of AA.

Transect	Buffer Width (m)
A	>250m
B	↓
C	
D	
E	
F	
G	
H	↓
Average Buffer Width	250m

Worksheet 3: Structural Patch Type for Vernal Pool Systems.

Identify each type of patch that is observed in the AA and use the total number of observed patch types in Table 15. Patch type definitions are provided on the next page.

Structural Patch Type	Check for presence
Small individual pools	✓
Large individual pools	
Small swales	
Large swales	
More than 1 pool cluster (a set of 3 or more interconnected pools with nearest neighbors less than 5 m apart)	
Drainage branches (more than 1 drainage branch)	
Simply-shaped pools (mostly round or oval)	✓
Complexly-shaped pools (not mostly round or oval)	
Plant hummocks	
Mima mounds	
Animal burrows	
Bare soil	✓
Soil cracks	
Cobble	
Total Possible	14
No. Observed Patch Types (enter here and use in Table 15)	3

Worksheet 4a: Plant Community Metric –

Co-dominant Plant Species in Individual Vernal Pools.

Note: A dominant species represents $\geq 10\%$ *relative cover*. Count species only once when calculating any Plant Community sub-metric.

Co-dominant Species	
Total number of co-dominant species	2

Worksheet 4b: Plant Community Metric –


List of Unique Co-dominant Plant Species in Individual Vernal Pool.

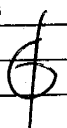
Plant Name	Check if invasive	Check if in Appendix I
Polygonum sp.	✓	
Spargularia sp.	✓	
Total number of co-dominant species (A)	2	
Total number of co-dominant species that are invasive (B)	2	
Percent Invasion $[(B)/(A) \times 100]$ (enter here and use in Table 19)	100%	
Total number of co-dominant species that are endemic (enter here and use in Table 20)	0	

Wetland disturbances and conversions.

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	Lacustrine	seep or spring	playa	

Worksheet 5: Stressor Checklist.

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)		
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		
		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Filling or dumping of sediment or soils (N/A for restoration areas)		
Grading/ compaction (N/A for restoration areas)		
Plowing/Discing (N/A for restoration areas)		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		
		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation	✓	
Predation and habitat destruction by non-native vertebrates (e.g., <i>Virginia opossum</i> and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	✓	
Lack of treatment of invasive plants adjacent to AA or buffer	✓	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		
⊗		

Basic Information: Individual Vernal Pools

Which best describes the hydrologic state of the wetland at the time of assessment?

- ☒ ponded/inundated ☐ saturated soil, but no surface water ☐ dry

What is the apparent hydrologic regime of the wetland?

- ☐ long-duration ☐ medium-duration ☐ short-duration

Does the individual vernal pool connect with the floodplain of a nearby stream? ☐ yes ☒ no

P-4 = Photo 8

Sally T

Amy M

Scoring Sheet: Individual Vernal Pools

AA Name: <u>P-4</u>			(m/d/y)	<u>2/27/11</u>	
Attributes and Metrics			Alpha.	Numeric	Comments
Buffer and Landscape Context					
(A) Landscape Connectivity			<u>D</u>	<u>3</u>	<u>only other VPs/rd pools</u>
(B): Percent of AA with Buffer	Alpha.	Numeric			
	<u>A</u>	<u>12</u>			
(C): Average Buffer Width	<u>A</u>	<u>12</u>			
(D): Buffer Condition	<u>C</u>	<u>6</u>			
					<u>100% buffer</u>
					<u>250m</u>
					<u>NNG + dirt rds</u>
Initial Attribute Score = $A + [D \times (B \times C)^{1/2}]^{1/2}$				<u>11.4</u>	Final Attribute Score = (Initial Score/24) x 100 <u>47.5</u>
Hydrology					
Water Source			<u>A</u>	<u>12</u>	<u>precip.</u>
Hydroperiod			<u>B</u>	<u>9</u>	<u>vehicle traffic creates deeper pockets</u>
Hydrologic Connectivity			<u>A</u>	<u>12</u>	<u>unrestricted</u>
Initial Attribute Score				<u>33</u>	Final Attribute Score = (Initial Score/36) x 100 <u>91.7</u>
Physical Structure					
Structural Patch Richness			<u>C</u>	<u>6</u>	<u>mima mounds!</u>
Topographic Complexity			<u>D</u>	<u>3</u>	<u>no slope/rd nets</u>
Initial Attribute Score				<u>9</u>	Final Attribute Score = (Initial Score/24) x 100 <u>37.5</u>
Biotic Structure					
Plant Community submetric A: Number of Co-dominant species	Alpha.	Numeric			
	<u>D</u>	<u>3</u>			
Plant Community submetric B: Percent Invasion	<u>D</u>	<u>3</u>			
Plant Community submetric C: Endemic Species Richness	<u>D</u>	<u>3</u>			
					<u>2 spp.</u>
					<u>100%</u>
					<u>0</u>
Plant Community Metric (average of submetrics A-C)			<u>3</u>	<u>3</u>	
Horizontal Interspersion and Zonation			<u>C</u>	<u>6</u>	<u>small patches of bare dirt/deeper road not</u>
Initial Attribute Score				<u>9</u>	Final Attribute Score = (Initial Score/24) x 100 <u>37.5</u>
Overall AA Score (Average of Final Attribute Scores)				<u>314.2/4 = 54</u>	

Worksheet 1: Landscape Connectivity Metric for Individual Vernal Pools.

Percentage of Each Transect Line Crossing Wetland or Other Aquatic Habitat	
Transect	Percent Crossing Aquatic Area
North	25%
South	↓
East	
West	
Average Percent Crossing Aquatic Area for all Four Transects	25%

Worksheet 2: Calculating average buffer width of AA.

Transect	Buffer Width (m)
A	250
B	↓
C	
D	
E	
F	
G	↓
H	
Average Buffer Width	250m

Worksheet 3: Structural Patch Type for Vernal Pool Systems.

Identify each type of patch that is observed in the AA and use the total number of observed patch types in Table 15. Patch type definitions are provided on the next page.

Structural Patch Type	Check for presence
Small individual pools	✓
Large individual pools	
Small swales	
Large swales	
More than 1 pool cluster (a set of 3 or more interconnected pools with nearest neighbors less than 5 m apart)	
Drainage branches (more than 1 drainage branch)	
Simply-shaped pools (mostly round or oval)	✓
Complexly-shaped pools (not mostly round or oval)	✓
Plant hummocks	✓
Mima mounds	✓
Animal burrows	
Bare soil	✓
Soil cracks	
Cobble	
Total Possible	14
No. Observed Patch Types (enter here and use in Table 15)	5

Worksheet 4a: Plant Community Metric –

Co-dominant Plant Species in Individual Vernal Pools.

Note: A dominant species represents $\geq 10\%$ *relative* cover. Count species only once when calculating any Plant Community sub-metric.

Co-dominant Species	
Total number of co-dominant species	2

Worksheet 4b: Plant Community Metric –


List of Unique Co-dominant Plant Species in Individual Vernal Pool.


Plant Name	Check if invasive	Check if in Appendix I
Lolium (awn)	✓	
Lepidium	✓	
Total number of co-dominant species (A)	2	
Total number of co-dominant species that are invasive (B)	2	
Percent Invasion $[(B)/(A) \times 100]$ (enter here and use in Table 19)	100%	
Total number of co-dominant species that are endemic (enter here and use in Table 20)	0	

Wetland disturbances and conversions.

Has a major disturbance occurred at this wetland?	<u>Yes</u>	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	<u>other</u>
If yes, then how severe is the disturbance?	<u>likely to affect site next 5 or more years</u>	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	Lacustrine	seep or spring	playa	

Worksheet 5: Stressor Checklist.

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)		
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		
		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Filling or dumping of sediment or soils (N/A for restoration areas)		
Grading/ compaction (N/A for restoration areas)		
Plowing/Discing (N/A for restoration areas)		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		
		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation	✓	
Predation and habitat destruction by non-native vertebrates (e.g., <i>Myiarchus cinerascens</i> and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	✓	
Lack of treatment of invasive plants adjacent to AA or buffer	✓	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

Basic Information: Individual Vernal Pools

Which best describes the hydrologic state of the wetland at the time of assessment?

- ☒ ponded/inundated ☐ saturated soil, but no surface water ☐ dry

What is the apparent hydrologic regime of the wetland?

- ☐ long-duration ☐ medium-duration ☐ short-duration

Does the individual vernal pool connect with the floodplain of a nearby stream? ☐ yes ☒ no

Photo 9- P5

Sally T

Amy M

Scoring Sheet: Individual Vernal Pools

AA Name: <u>P-5</u>			(m/d/y)	<u>2/27/11</u>	
Attributes and Metrics		Alpha.	Numeric	Comments	
Buffer and Landscape Context					
(A) Landscape Connectivity		<u>D</u>	<u>3</u>	<u>only other rd/VPs</u>	
(B): Percent of AA with Buffer	Alpha. <u>A</u>	Numeric <u>12</u>	<u>100%</u>		
(C): Average Buffer Width	<u>B</u>	<u>9</u>	<u>184m</u>		
(D): Buffer Condition	<u>C</u>	<u>6</u>	<u>WVG + dirt rds</u>		
Initial Attribute Score $= A + [D \times (B \times C)]^{1/2}$ <u>$3 + [6 \times (12 \times 9)]^{1/2}$</u>			<u>10.9</u>	Final Attribute Score = (Initial Score/24) x 100	<u>45.4</u>
Hydrology					
Water Source		<u>A</u>	<u>12</u>	<u>natural precip.</u>	
Hydroperiod		<u>B</u>	<u>9</u>	<u>vehicle traffic creates deeper pocket</u>	
Hydrologic Connectivity		<u>A</u>	<u>12</u>	<u>unrestricted</u>	
Initial Attribute Score			<u>33</u>	Final Attribute Score = (Initial Score/36) x 100	<u>91.7</u>
Physical Structure					
Structural Patch Richness		<u>C</u>	<u>6</u>	<u>mima mounds</u>	
Topographic Complexity		<u>D</u>	<u>3</u>	<u>no complexity</u>	
Initial Attribute Score			<u>9</u>	Final Attribute Score = (Initial Score/24) x 100	<u>37.5</u>
Biotic Structure					
Plant Community submetric A: Number of Co-dominant species	Alpha. <u>D</u>	Numeric <u>3</u>	<u>1 sp.</u>		
Plant Community submetric B: Percent Invasion	<u>D</u>	<u>3</u>	<u>100%</u>		
Plant Community submetric C: Endemic Species Richness	<u>D</u>	<u>3</u>	<u>0</u>		
Plant Community Metric (average of submetrics A-C)		<u>D</u>	<u>3</u>		
Horizontal Interspersion and Zonation		<u>C</u>	<u>6</u>	<u>2 zones</u>	
Initial Attribute Score			<u>9</u>	Final Attribute Score = (Initial Score/24) x 100	<u>37.5</u>
Overall AA Score (Average of Final Attribute Scores)			<u>$212.1/4 = 53$</u>		

Worksheet 1: Landscape Connectivity Metric for Individual Vernal Pools.

Percentage of Each Transect Line Crossing Wetland or Other Aquatic Habitat	
Transect	Percent Crossing Aquatic Area
North	25%
South	1
East	
West	
Average Percent Crossing Aquatic Area for all Four Transects	25%

Worksheet 2: Calculating average buffer width of AA.

Transect	Buffer Width (m)
A	250
B	1
C	
D	
E	168
F	67
G	67
H	168
Average Buffer Width	184 m

Worksheet 3: Structural Patch Type for Vernal Pool Systems.

Identify each type of patch that is observed in the AA and use the total number of observed patch types in Table 15. Patch type definitions are provided on the next page.

Structural Patch Type	Check for presence
Small individual pools	
Large individual pools	✓
Small swales	
Large swales	
More than 1 pool cluster (a set of 3 or more interconnected pools with nearest neighbors less than 5 m apart)	
Drainage branches (more than 1 drainage branch)	
Simply-shaped pools (mostly round or oval)	
Complexly-shaped pools (not mostly round or oval)	✓
Plant hummocks	✓
Mima mounds	✓
Animal burrows	
Bare soil	✓
Soil cracks	
Cobble	
Total Possible	14
No. Observed Patch Types (enter here and use in Table 15)	5

Worksheet 4a: Plant Community Metric –

Co-dominant Plant Species in Individual Vernal Pools.

Note: A dominant species represents $\geq 10\%$ *relative* cover. Count species only once when calculating any Plant Community sub-metric.

Co-dominant Species	
Total number of co-dominant species	1

Worksheet 4b: Plant Community Metric –

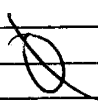
List of Unique Co-dominant Plant Species in Individual Vernal Pool.

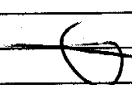
Plant Name	Check if invasive	Check if in Appendix I
Lolium	✓	
Total number of co-dominant species (A)	1	
Total number of co-dominant species that are invasive (B)	1	
Percent Invasion $[(B)/(A) \times 100]$ (enter here and use in Table 19)	100%	
Total number of co-dominant species that are endemic (enter here and use in Table 20)	0	

Wetland disturbances and conversions.

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	Lacustrine	seep or spring	playa	

Worksheet 5: Stressor Checklist.

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Point Source (PS) discharges (PCOTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)		
Flow diversions or unnatural inflows		
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel		
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees		
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		
		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Filling or dumping of sediment or soils (N/A for restoration areas)		
Grading/ compaction (N/A for restoration areas)		
Plowing/Discing (N/A for restoration areas)		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		
		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation	✓	
Predation and habitat destruction by non-native vertebrates (e.g., <i>Virginia opossum</i> and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources	✓	
Lack of treatment of invasive plants adjacent to AA or buffer	✓	
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present and likely to have negative effect on AA	Significant negative effect on AA
Urban residential		
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		

EXT-1

Basic Information: Individual Vernal Pools

Which best describes the hydrologic state of the wetland at the time of assessment?

☒ ponded/inundated

☐ saturated soil, but no surface water

☐ dry

What is the apparent hydrologic regime of the wetland?

☐ long-duration

☐ medium-duration

☐ short-duration

Does the individual vernal pool connect with the floodplain of a nearby stream? ☐ yes ☒ no

Sally Trnka
Erica Harris

photo 5 - EXT-1

Scoring Sheet: Individual Vernal Pools

AA Name: EXT - J			(m/d/y)	03/03/11	
Attributes and Metrics		Alpha.	Numeric	Comments	
Buffer and Landscape Context					
(A) Landscape Connectivity		D	3	only vernal/road pools 100% wide buffer ↑ mng (mostly), but soils are undisturbed & little or no human visit.	
(B): Percent of AA with Buffer	Alpha. A	Numeric 12			
(C): Average Buffer Width	A	12			
(D): Buffer Condition	B	9			
Initial Attribute Score = $A + [D \times (B \times C)]^{1/2}$			13.4	Final Attribute Score = (Initial Score/24) x 100	56
Hydrology					
Water Source		A	12	precipitation only	
Hydroperiod		A	12	natural pattern of filling/drawdown	
Hydrologic Connectivity		A	12	unrestricted flow	
Initial Attribute Score			36	Final Attribute Score = (Initial Score/36) x 100	100
Physical Structure					
Structural Patch Richness		D	3	3 patch types	
Topographic Complexity		D	3	mostly flat, some microtopo.	
Initial Attribute Score			6	Final Attribute Score = (Initial Score/24) x 100	25
Biotic Structure					
Plant Community submetric A: Number of Co-dominant species	Alpha. D	Numeric 3	2 species 100% 0		
Plant Community submetric B: Percent Invasion	D	3			
Plant Community submetric C: Endemic Species Richness	D	3			
Plant Community Metric (average of submetrics A-C)			3		
Horizontal Interspersion and Zonation		D	3	uniform, flat	
Initial Attribute Score			6	Final Attribute Score = (Initial Score/24) x 100	25
Overall AA Score (Average of Final Attribute Scores)				206/4 = 52	

Worksheet 1: Landscape Connectivity Metric for Individual Vernal Pools.

Percentage of Each Transect Line Crossing Wetland or Other Aquatic Habitat	
Transect	Percent Crossing Aquatic Area
North	15
South	5
East	5
West	5
Average Percent Crossing Aquatic Area for all Four Transects	7.5

Worksheet 2: Calculating average buffer width of AA.

Transect	Buffer Width (m)
A	256
B	↓
C	
D	
E	
F	
G	
H	
Average Buffer Width	↓

Worksheet 3: Structural Patch Type for Vernal Pool Systems.

Identify each type of patch that is observed in the AA and use the total number of observed patch types in Table 15. Patch type definitions are provided on the next page.

Structural Patch Type	Check for presence
Small individual pools	✓
Large individual pools	
Small swales	
Large swales	
More than 1 pool cluster (a set of 3 or more interconnected pools with nearest neighbors less than 5 m apart)	
Drainage branches (more than 1 drainage branch)	
Simply-shaped pools (mostly round or oval)	
Complexly-shaped pools (not mostly round or oval)	✓
Plant hummocks	
Mima mounds	✓
Animal burrows	
Bare soil	
Soil cracks	
Cobble	
Total Possible	14
No. Observed Patch Types (enter here and use in Table 15)	3

Worksheet 4a: Plant Community Metric –

Co-dominant Plant Species in Individual Vernal Pools.

Note: A dominant species represents $\geq 10\%$ *relative cover*. Count species only once when calculating any Plant Community sub-metric.

Co-dominant Species	
Total number of co-dominant species	

Worksheet 4b: Plant Community Metric –

List of Unique Co-dominant Plant Species in Individual Vernal Pool.

Plant Name	Check if invasive	Check if in Appendix I
Avena sp.	✓	
Lolium sp.	✓	
Ery. ari present, but <10% relative cover		
Total number of co-dominant species (A)	2	
Total number of co-dominant species that are invasive (B)	100% 2	
Percent Invasion [(B)/(A) x 100] (enter here and use in Table 19)	100%	
Total number of co-dominant species that are endemic (enter here and use in Table 20)	0	